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Modeling Case Managers' Care Planning Decisions for Community Dwelling Disabled Elders in Medicaid Home and Community Based Services Waiver Programs

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Case managers allocate long-term care services for the disabled elderly. This research looked at [1] the effect of client preferences on plan recommendations, and [2] the effect of case manager and agency characteristics on care plan recommendations,

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Little is known about how consumer preferences affect case managers' care planning decisions. The research will investigate three elements of this interaction (1) the effect of client preferences on case managers' care planning decisions, (2) how the effect

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MODELING CASE MANAGERS' CARE PLANNING DECISIONS
FOR COMMUNITY DWELLING DISABLED ELDER
IN MEDICAID HOME AND COMMUNITY BASED SERVICES
WAIVER PROGRAMS

A THESIS
SUBMITTED TO THE FACULTY OF THE GRADUATE SCHOOL
OF THE UNIVERSITY OF MINNESOTA
BY

HOWARD DEGENHOLTZ

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

ROSALIE A. KANE, ADVISER

NOVEMBER 1997

UNIVERSITY OF MINNESOTA

This is to certify that I have examined this copy of a doctoral thesis by

and have found that it is complete and satisfactory in all respects,
and that any and all revisions required by the final
examining committee have been made.

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CHAPTER 1: INTRODUCTION

1.1 Purpose of Study

Case managers, typically trained as social workers or nurses, authorize, allocate, and arrange long-term care services for the disabled elderly in a range of publicly funded programs across the United States (GAO, 1993; Leutz, Abrahams, & Capitman, 1994; Kemper, 1990; Freedman & Kemper, 1994). Due in part to the prevalence of functional disability among the elderly and the overall aging of the population, service allocation decisions for the frail elderly have immense cost implications and are the subject of much public policy debate. In 1994, there were 5.4 million functionally disabled people over 65 living in the community (Manton, Corder & Stallard, 1997). While most care for these people is provided by family and friends, in 1989, \$5.3 billion was spent on the 30% who use formal home care providers; 73% of that comes from public programs (Feder, 1991).

Medicaid Home and Community Based Services (HCBS) Waiver programs (hereafter referred to as 'waiver programs') financed community-based long-term care for 194,132 disabled elderly persons in 1995 (APWA, unpublished data). While this is a small percentage of the overall population needing services, these programs are significant because they represent an explicit effort to reduce Medicaid expenditures away from nursing facilities into alternative settings (CRS, 1993). Waiver programs have experienced dramatic growth in both the number of people served and overall expenditures in the years since they were first authorized. Programs serving the elderly are now in place in all 50 states and the District of Columbia.

In all state waiver programs, eligibility determination and allocation of services are done by case managers who work in local agencies or state offices (Justice, 1993). Previous research has examined the determinants of use, cost, and potential for home and community-based services to substitute for or prevent nursing home use. However, less attention has been paid to case manager decision making. In particular, little is known about how consumer preferences affect case managers' care planning decisions. While respect for client autonomy, preferences

and self-determination are often noted as guiding principles in case management practice, on a day-to-day basis, clients' actual preferences are not typically assessed or recorded. One purpose of this study is to examine the effects of client preferences on case managers' care plan recommendations while controlling for other factors known to put disabled elderly persons at risk of using CBLTC and nursing home care (e.g., limited physical and cognitive function, poor informal support).

Aim 1: What is the effect of client preferences on case managers' care plan recommendations, controlling for the level of risk and amount of available resources?

Eligibility determination and service authorization in Medicaid waiver programs are done by case managers in decentralized, local agencies or state offices (Justice 1993; Kemper 1990; Leutz, Abrahams & Capitman, 1993; Spector & Kemper, 1994). Eligibility rules are standardized within state programs and linked to eligibility for Medicaid financed nursing home care (CRS, 1993; O'Keefe, 1996). Standardized assessments are typically required to determine whether potential clients are eligible, and for what level of services (Justice, 1993; O'Keefe, 1996). However, the actual type and amount of services authorized (e.g. the care plan) must be tailored to the individual client's situation and environment (Schneider, 1988). This tends to leave considerable discretion in the hands of individual case managers. The second purpose of this study is therefore to examine variation in care plan recommendations among individual case managers and case managers from different local case management agencies, controlling for client characteristics.

Aim 2: What is the effect of case manager and case management agency characteristics on case manager's care plan recommendations, controlling for individual client characteristics?

This study uses original data collected with a survey of 2135 case managers from 211 local agencies in 11 state-wide long-term care programs funded through Medicaid home and community based services waivers. The survey presented case managers with questions about care plans for 18 hypothetical scenarios that described typical elderly long-term care clients. Data were also collected that describe the individual case managers and the local agencies.

Chapter 1: Introduction

Hierarchical models are used to estimate the effect of client, case manager and agency characteristics on case manager care plan recommendations. This methodology takes into account the fact that clients are nested within case managers and individual case managers are nested within local agencies. The data set has multiple observations for each case manager (up to 18) and agency (ranging from 1 to 37). In general, when a data set contains multiple observations from the same individual or cross-sectional unit, they may be correlated with one another (e.g., responses are more similar within individual respondents than among individuals). In traditional analysis this is often treated as a nuisance. Hierarchical models, however, were specifically developed to measure these correlations and test theoretical models about the sources of within- and between-individual variation.

1.2 Contribution of Current Study to Empirical Research in Bioethics

It is important to recognize that service allocation decisions have an ethical component as well as a cost component. At the systems level, the definition of who is eligible for publicly funded services reflects fundamental social values of fairness and procedures for distributive justice. At the individual level, which is the focus of this study, service allocation decisions determine receipt of care that is personal in nature and delivered in the intimacy of one's own home. The principles that guide service authorization and delivery at the individual level are respect for autonomy and beneficence (Beauchamp & Childress, 1994; Collopy, 1990; Kane, 1992; Kane, Caplan & Thomas, 1994). The present study is specifically designed to examine individual variation in how client preferences affect case managers' care plan recommendations.

The normative literature in bioethics (Beauchamp & Childress, 1994), ethics in long-term care (Collopy, 1990; Agich, 1993), and the practical literature on case management (Kane, 1992; Kane, Caplan & Thomas, 1994; Schneider, 1982; Schneider 1988; Quinn, 1993) suggest that professionals should balance respect for client preferences (autonomy) with their responsibility for client health and safety (beneficence) and obligation to control costs. Related to the

obligation to control costs is the fact that services provided to one client may diminish the resources available to another. One definition of justice is that similar cases should be treated the same. The point is often made that the balancing point for any particular case is a function of the situation and the individual making the decision. Whether an act or arrangement is ethical often depends on the values and preferences of the involved parties.

It has been suggested that the rightness or wrongness of moral principles can not be informed by empirical investigation (Brody, 1993). Empirical research, it is maintained, can determine whether principles are being followed or if certain negative consequences arise, not whether or not principles themselves are correct. This study is designed to test hypotheses about variation in the weight professionals place on client preferences when making allocation decisions. The purpose is to demonstrate that it is possible to quantitatively measure differences in how individuals apply the principle of respect for autonomy (albeit in a restricted sense).

The methodology used by the present study will allow a 'map' to be developed that charts situations where client preferences dominate other factors, and where client preferences are over-ridden. The map will also illustrate whether differences among individuals exist, and if they do, (1) whether they might lead to different outcomes for the same case, and (2) whether these differences are associated with measured characteristics of the individual and her workplace. The findings may show that individual case managers place different relative weight on safety and autonomy when making decisions for the disabled elderly, even when controlling for other relevant aspects of the case.

1.3 Organization of Dissertation

This dissertation is divided into six chapters, including this introduction. Chapter 2 reviews the relevant literature in long-term care, case management and bioethics. Chapter 3 presents the methods used to collect and analyze data. Chapter 4 presents the results for each

Chapter 1: Introduction

multiple regression model. Chapter 5 summarizes the significant results in Chapter 4 and provides point estimates for straightforward interpretation of the findings. Chapter 6 is a discussion of the practical, technical, theoretical and policy significance of the findings.

CHAPTER 2: LITERATURE REVIEW

2.1 Long-Term Care

This study is about allocation of community-based long-term care in publicly funded long-term care programs. Long-term care is defined most generally by reference to functional capacity:

Long-term care is a set of health, personal care and social services delivered over a sustained period of time to persons who have lost or never acquired some degree of functional capacity. (Kane & Kane, 1987)

Functional capacity is typically understood in terms of the ability to perform one or more activities of daily living (ADLs) (i.e., bathing, dressing, moving in and out of bed, feeding oneself, and using the toilet) (Katz, 1963).¹ Other everyday functions, known as instrumental activities of daily living (IADLs) (i.e., using a telephone, shopping, food preparation, housekeeping, laundry, transportation, financial management and medication management) may also be used in defining disability (Lawton & Brody, 1970). By defining long-term care as those services intended to meet functional needs, this definition is not tied to the setting where care is delivered or any particular package of services or types of providers.

Of the 7.2 million chronically disabled² Americans over 65, 76% (5.4 million) live in the community and 24% live in institutions (Manton, Corder & Stallard, 1997). For disabled elderly living in the community, most (70%) receive long-term care is provided by family, friends or neighbors (Rowland & Lyons, 1991; Spillman & Kemper, 1992). More than a quarter (27%),

¹Continenence, one of Katz's original items, is considered a physiological impairment rather than a functional disability and is omitted from the list of ADLs (Leering, 1979).

²Disability was defined as being unable to perform one or more instrumental activity of daily living (e.g., cooking, cleaning, doing laundry) or one or more activity of daily living (e.g., bathing, dressing, toileting, transferring or eating) without personal assistance or special equipment. Chronic disability was defined as disability that had persisted for more than 90 days (Manton, Corder & Stallard, 1997).

Chapter 2: Literature Review

however, also receive care from paid providers; only a small minority (3%) receive care just from paid providers (Rowland & Lyons, 1991; Spillman & Kemper, 1992). Paid home care, also referred to as 'formal' care, includes help with unskilled tasks such as housekeeping, personal care and transportation, and skilled tasks such as nursing, physical, speech and occupational therapy.

Since its inception in 1965, Medicaid, the federal/state program that pays for health care for the poor, has become the largest government payor for nursing homes. In 1995, \$40 billion out of \$45.9 billion total government payments were through Medicaid (HCFA, unpublished data). The total expenditures on nursing home care for the entire nation were \$77.9 billion. By contrast, in 1995, Medicaid spent only \$9.6 on home and community based care.

In an attempt to change the bias toward institutionalization, and reduce the link between the type of care and the delivery setting, in 1981 Congress passed legislation that allowed states to provide expanded home and community-based services as an alternative for people who would otherwise need nursing home care. Section 2176 of the Omnibus Reconciliation Act of 1981 (OBRA '81) provided the Health Care Financing Authority (HCFA) the authority to waive several statutory requirements for states wishing to provide home and community-based alternatives to institutionalization for disabled beneficiaries. Key to the design of these new programs, known as 'waiver programs', was that states could limit the amount of money that would be spent each year, rather than be committed to an open ended entitlement as with other Medicaid benefits. Indeed, the fear of runaway costs appears to have led state Medicaid departments to severely restrict the use of the mandated home health benefit and limited their interest in the optional personal care benefit (Feder, 1991). Another key provision of waiver programs is the requirement that all clients must have an assessment and an "individual written plan of care" (US Department of Health and Human Services, Health Care Financing Administration, 1997). States typically elect to use case managers to conduct assessments and develop care plans (Justice, 1991).

Even considering these regulatory controls, waiver programs have been increasingly popular with states and have grown rapidly over the past 16 years. In 1982, total Medicaid expenditures for home care were \$168 million; \$3.8 million of which was spent through waiver programs (Miller, 1992). In 1995, Medicaid expenditures on home-based care were \$9.6 billion; \$4.8 billion through waiver programs (HCFA, unpublished data).

2.1.1 Community Based Long-Term Care Demonstration Projects

Starting in the 1970s, the Federal government funded a number of demonstration projects intended to test the feasibility and cost effectiveness of expanded community based long-term care. Of crucial interest was whether expanded formal in-home services would save public money by substituting for institutional care. Services provided included homemaker, chore, personal care, transportation, delivered meals, day care, counseling, physical therapy, and nursing. A key component of all demonstration projects was the use of case management to screen eligible clients, assess their needs, authorize services and monitor their care (Weissert, Cready & Pawelak 1988; Carcagno, 1988).

Systematic reviews of these demonstrations (Weissert et al., 1988; Kemper, Applebaum & Harrigan, 1988; Berkeley Planning Associates, 1985) showed that while it is possible to serve certain individualist in their own homes at lower cost than in the community, it is exceedingly difficult to limit service eligibility to only those individuals. As a result, people who would not have received publicly funded nursing home will care receive community-based services, increasing aggregate costs (Kemper, Applebaum & Harrigan, 1988).

The experience of the National Long-term Care Channeling Demonstration (Channeling) is telling. Channeling was a randomized trial of two levels of expanded financing for community based long-term care (Carcagno & Kemper, 1988). The 'basic' model funded case managers to help clients coordinate care and permitted case managers to spend a small amount of money to 'fill gaps' in the service needs of study participants. The 'financial control' model provided substantial funds for the purchase of a variety of in-home services in addition to the case

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management of the basic model. The project screened all applicants in an attempt to serve those people at highest risk of institutionalization. The findings from the evaluation showed that there was no substantial reduction in either nursing home use or any effect on hospital use, physician use, or other medical services (Kemper, 1988). Total costs increased by 18% in the financial control model (although costs to clients and families were reduced by 7%). And while Channeling reduced unmet needs, increased client satisfaction with life and confidence in their care, and dramatically increased caregiver satisfaction (Kemper, 1988), it is not clear that the small magnitude of these effects outweighs the cost (Weissert, 1988).

As Weissert points out (1988), even though many of these findings were known or suspected prior to the implementation of Channeling, community-based long-term care programs were politically successful (Pelham & Clark, 1986). This led Congress, in 1981 to pass legislation that authorized states to finance community-based long-term care with Medicaid dollars with the rationale of saving money by preventing or postponing nursing home care (CRS, 1993). Numerous programs have also been implemented by states that do not rely on federal financing. Such state-revenue only programs target somewhat different populations in terms of eligibility and frailty, however they offer a similar range of community-based long-term care services and most use case management (Feder, 1991; Justice, 1993). Indeed, state policy makers point to case management as a key factor in controlling program growth and expenses (GAO, 1994).

2.1.2 Characteristics of Users of Community Based Long-term Care

Use of community based long-term care among the elderly care is associated with four general factors: functional status, cognitive status, health condition, and social support. Limited functional capacity, measured by ADL or IADL impairment, is associated with a greater likelihood of using paid home care, using more services units, and higher costs in both the general elderly population (Branch et al., 1988; Evashwick, Rowe, Diehr & Branch, 1984; McCauley & Arling, 1984) and among the disabled elderly (Coughlin, McBride, Perozek & Liu, 1992; Kemper, 1992;

Liu, McBride & Coughlin, 1990; Soldo, 1985; Spillman & Kemper, 1992).

Impaired cognitive function has had inconsistent effects on use of home care. When measured in terms of a need for supervision, impaired cognitive function increases the use of home care (Soldo, 1985). Coughlin et al. (1992) used a scaled measure of cognitive function, and found no effect after controlling for other variables. Kemper (1992) found that cognitive impairment and inappropriate behaviors decreased the likelihood of receiving paid home care, but increased the amount used. The author speculated that this was perhaps a result of unwillingness on the part of providers, or due to the excessive cost of providing the care.

Elderly who report poor health status (Evashwick, et al. 1984), those with neurological disorders (Coughlin, et al., 1992), or whose health had worsened in the past year (Kemper, 1992) were more likely to use formal home care. The availability of social support, in the form of spouse, children, other relatives, family or friends generally has a negative effect on the amount of formal home care the disabled elderly receive (Kemper, 1992; Soldo, 1985; Coughlin, et al., 1992).

After controlling for other variables, age has shown a positive effect on use of home care (Coughlin, et al., 1992; Evashwick et al., 1984). However, in one study it had no effect (Kemper, 1992).

2.2 Medicaid Home and Community Based Services Waiver Programs

Prior to 1981, Medicaid did not cover such services as personal care except through the optional personal care benefit which was not widely used by many states. State concern over the entitlement nature of Medicaid and the medically-oriented definition of personal care under the benefit are cited as reasons for generally low use of this program. There are exceptions however, with some states (e.g. New York) relying heavily on the personal care benefit (Feder, 1991). In 1989, 29 states offered personal care as a standard benefit (Lewis-Idema, Falik & Ginsburg, 1991). Medicaid covers home health care as a standard benefit, however states have been also reluctant to allow this benefit to be widely used for the chronically disabled, and have

used strict eligibility criteria to curtail its use (Feder, 1991).

The OBRA '81 established a method for states to provide home and community based services for disabled persons who would otherwise require institutional care. The goal was to prevent or postpone institutionalization with unskilled and socially oriented services that help disabled people live independently. Under section 2176 of the OBRA '81, waivers can be used to finance a broad array of services for the mentally ill, disabled, the elderly or other populations without creating an entitlement. This makes waivers more attractive to states wishing to cover certain sub-groups at lower financial risk. In 1995, Medicaid spending on home and community based waivers was \$4.8 billion, compared to \$2.9 billion for the personal care benefit and \$1.9 billion for home health.

There are three Medicaid requirements that may be waived when establishing a program: state-widenedness, comparability, and financial eligibility. Dropping the state-widenedness requirement enables states to cover services in a specific regions, rather than the entire state. This allows states to experiment with small scale programs before expanding them, or to develop different approaches in different regions. By waiving the comparability requirement, services do not have to be comparable in scope, duration and amount for different groups of eligible persons. States can literally carve out hard to serve individuals or subgroups (e.g. persons disabled due to traumatic brain injuries) and tailor programs to their needs. Finally, the financial eligibility requirements for persons living in the community may be waived, allowing states to use the more liberal limits for persons living in institutions (up to 300% of the poverty level).

When the waiver authority was established Congress was concerned that offering lower cost alternatives to institutional care would increase rather than decrease or keep constant total costs due to increased demand for waiver services (CRS, 1993). Waiver programs therefore had to demonstrate 'budget neutrality' in order to be approved by the Secretary of the Department of Health and Human Services. In principle, the average cost of serving an individual under the waiver could not exceed the average cost of care in an institution.

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Additionally, states were required to document that for each waiver beneficiary there was an empty or closed bed in an institution. This stipulation, referred to as the 'cold bed' provision, was intended to prevent the 'woodwork effect' of increased demand from previously unserved but eligible persons under a new, desirable publicly funded program (GAO, 1994). The cold bed provision also served to limit the overall expenditures for each waiver by requiring the state to specify how many individuals would be served and multiplying that by the average cost. Under this rule, if lower cost services were provided, the extra money could not be used to serve additional individuals. However, if beds are closed or new ones are not built, it is hard to calculate the savings. This limitation, as well as disagreements between states and HCFA over how to measure what nursing home bed supply would have been without the waiver led to dropping the cold bed provision in 1994 (GAO, 1994).

Medicaid waivers can be used to finance long-term care for a variety of populations at risk of requiring institutionalization. This may include children, adults or elderly (>65) who are mentally retarded, developmentally disabled, functionally disabled. Waivers can also be used for people with AIDS, people who are technology dependent (e.g., a ventilator), people with traumatic brain injuries or rare diseases. The covered populations and scope of the waiver is up to the individual state. Some states use the same waiver to finance services for elderly and non-elderly disabled people, other states use separate waivers for the elderly and the disabled elderly.

In 1994 there were a total of 194 active waivers; 57 for the elderly or disabled elderly (APWA, unpublished data). While all states had at least one waiver for the elderly,³ not all programs had clients enrolled. The American Public Welfare Association (APWA), under contract to HCFA, maintains a clearinghouse of information on waiver programs. APWA updates this database through surveys of state Medicaid agencies, but some states report

³Arizona is a special case because its entire Medicaid program operates under an 1115 'demonstration' waiver.

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unduplicated counts of clients and some report projections. Expenditure data for each state's Medicaid program are regularly reported to HCFA and include aggregate on waivers. However these data cannot be broken down by population (e.g. aged, disabled, mentally retarded etc.).

Finally, it must be noted that waivers programs are essentially funding programs, not service delivery systems. The rules and regulations for waiver programs must be implemented at the local level by service providers (which include case management as well as direct-care workers) who may be funded through a variety of financing mechanisms. Waivers are thus overlaid on the existing infrastructure of local agencies and state programs for the disabled, elderly and so on. There may be programs strictly dedicated to authorizing and providing waiver funded services. And new programs, providers, and systems may come into existence in response to availability of funds.

2.2.1 Eligibility for Medicaid Waiver Services

Eligibility for Medicaid waiver services can be broken down into financial, categorical, and service eligibility (O'Keefe, 1996). Financial eligibility is based on assets and income. The latter is typically 300% of poverty. In addition, clients may fall under nursing home asset restrictions, and may be required to 'spend-down' before becoming eligible for waiver services. Categorical eligibility is based receipt of other publicly funded benefits (e.g. Supplemental Security Income), age and diagnosis (e.g., in a target population). Individuals who meet financial and categorical requirements must also be found eligible for services. To be eligible to receive services financed by a Medicaid waiver, the individual must be eligible for Medicaid financed institutional level care in that state.

The criteria used to determine eligibility for services vary widely across states. Most use a combination of medical diagnosis and physical and cognitive function (O'Keefe, 1996). Some states weigh the need for nursing services more heavily than functional limitations (Alabama, Texas, Alaska and Massachusetts). Other states consider functional status as the primary determinant (Oregon, Kansas). All states use standardized assessment instruments to

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determine eligibility (Justice, 1993). However these instruments range from requiring a minimum score, a minimum number of specific impairments, to simply providing the assessor with a definition or guideline (O'Keefe, 1996).

O'Keefe (1996) categorized the types of criteria used by each state to show these differences in emphasis. Medical or nursing criteria (8 total) included the specific health condition, treatments being received, catheter/colostomy care, medications, need for regular monitoring, rehabilitation, dietary needs, and eating problems. Mental impairments (3 total) included cognitive impairment, behavioral problems/ need for supervision, and psychological status. Physical impairments (4 total) included sensory impairment, communication/aphasia, incontinence, and mobility. ADLs (6 total) included eating, toileting, bathing, transferring, dressing and grooming. IADLs (8 total) included medication management, shopping, housekeeping, laundry, money management, telephone use and transportation use. O'Keefe also tabulated whether the state included assessment of the informal support system in the eligibility determination. Table 2.1 shows, for each state in the present study, how standards are distributed across medical and functional domains. Note that all states, except Washington, use at least 5 out of 8 of the medically oriented criteria, and only four states use the full list of 8 IADLs (California, Florida, Ohio and Washington).

2.2.2 Services Covered Under Waivers

Under Medicaid waivers, states can provide a number of services not usually covered by Medicaid. This includes case management, homemaker, home health aide, personal care, adult day health, habilitation services, and respite care. All waivers for the elderly cover case management. The most common services are adult day health, respite care, homemaker, and personal care. Many also cover environmental modifications, emergency response systems, home health aide, chore services, and transportation (APWA, unpublished data).

Some states allow waiver services to be provided to clients living in residential settings.

This is permitted under waiver programs, however each state has different regulations and definitions for alternative housing settings and may target home and community based services to those settings (AoA, 1994). Alternative settings may include adult foster homes, board and care homes, personal care homes, assisted living, residential care facility. Table 2.2 shows the types of settings in which Medicaid waiver services may be provided in 11 states selected for the present study. The descriptions of the alternative settings is limited, however.

2.3 Case Management

It has been suggested that the profession of case management has been around for much longer than our present health care delivery system (Applebaum & Austin, 1990). Indeed, it may be difficult to find a sector of the delivery system without some form of case management. Case management is used to administer benefits in acute and long-term care settings (Capitman, 1988; MacAdam, Capitman, Yee, et al., 1989), as well as for mental health services (Kurtz, Bagarozzi and Pollane, 1984). It is a common feature in private long-term care insurance policies as well as public programs (Henderson, Souder, Bergman and Collard, 1988). There is also a growing field of private fee-for service case managers for long-term care (Kaye, 1993). It has also been used in capitated demonstration projects designed to integrate the financing and delivery of acute and long-term care (Yordi, 1988; Zawadski and Eng, 1988), and by health maintenance organizations that contract with Medicare (Pacala, et al 1995).

Case management is defined in the *Encyclopedia of Aging* as "a service function directed at coordinating existing resources to assure appropriate and continuous care for individuals on a case-by-case basis" (Maddox, 1987). This definition emphasizes coordination and continuity of care. Case managers oversee care delivered by a variety of providers, and assure that they do not overlap or leave gaps. It also implies that case management is distinct from service delivery; that it can be effective even if overlaid on the existing system without explicitly building capacity. Finally, case managers are seen as providing a service themselves, as well as administering benefits for services.

Another definition is used by the Health Care Financing Administration to refer to case management as a long-term care benefit:

Case management is commonly understood to be a system under which responsibility for developing a care plan for an impaired or disabled individual, locating and coordinating services specified in the care plan, and monitoring services over time rests with a designated person or organization (CRS, 1993).

This definition highlights responsibilities to individual clients, responsibilities that persist over time. Case management is a method of co-locating authority and power over resources for long-term care with a concomitant duty to plan and monitor those services.

2.3.1 Components of Case Management

While case management has been implemented in many different environments and with various goals, there is consensus on the core components of case management. These are screening and determining eligibility; assessing the need for services; care planning; arranging services and implementing the care plan; monitoring; and reassessment (Applebaum & Austin, 1990).

Case Finding & Eligibility Screening. Case finding refers to activities directed at identifying the target population and sorting out eligible individuals. Case finding is often passive; many agencies rely on referrals from hospital discharge planners or applicants for nursing home admission. Since comprehensive assessments are time consuming and expensive, agencies try to weed out ineligible individuals with brief eligibility screening typically done on the telephone by paraprofessional or clerical staff.

Assessment. Comprehensive assessments of physical and cognitive function, physical and mental health needs, social function and support, environment and resources are typically done in the home and may last from 1 to 3 hours. Standardized assessment forms are used on a statewide basis in all 42 waiver funded long-term care programs surveyed by Justice (1991).

Care Planning. Care planning is the process by which information from the assessment is translated in a package of services. The care plan specifies the type and amount of care

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provided by each source, sometimes including family and friends as well as formal providers. Based on a comprehensive functional and social assessment of the client, the case manager delineates the problems, defines realistic outcomes, and makes specific plans for achieving those outcomes (Schneider, 1988). Care plans should be discussed and revised along with the client and any involved family or friends. When viewed as a process, care planning continues until the care plan is accepted by all involved parties. The plan therefore "represents a professional judgment of the most appropriate way to provide help for this individual client, given the constraints of the client's situation and the system (Schneider, 1988)."

Service Implementation. Case management varies in terms of the amount of authority individual case managers have over resources and in the way they implement the care plan. The model with the least authority is the brokerage model. In the brokerage model, case managers can only refer their clients to providers and recommend a care plan. There is no guarantee that clients will actually receive the services recommended.

The service management model gives case managers purchasing authority. This is the model found in most Medicaid waivers (Applebaum & Austin, 1990). In this model, case managers can directly authorize payment for the services they recommend but cannot exceed a fixed budget. Budgets are typically set at either the individual client level (80% of programs) or at the aggregated case load level (20% of programs) and imposed as monthly (50% of programs) or as annual limits (50% of programs) (Justice, 1993).

The amount of money available for purchasing care is typically linked to the cost of nursing home care (Justice, 1993), however the price of nursing home care can vary across states. In the waiver programs selected for the present study, the average per capita per month amount was \$459 in 1994 (range from \$195 to \$867) (APWA, unpublished data).

An additional issue is identifying and contracting with providers. In some programs this is done by the local agency; in other programs this is done by a separate state agency. Direct authority over contracts has been associated with lower prices (Kemper, 1990) and perceived

ability to influence quality of care (Kane & Degenholtz, in press), however the prevalence of this programmatic feature is not known.

Monitoring & Reassessment. Case managers follow-up on services they order and monitor clients through phone calls and or home visits. Most programs require somewhat intensive follow up of new care plans, after which it is less frequent. About 60% of programs require home visits every 3 months, 4 programs require monthly visits, and the remainder require visits every 6 months (Justice, 1993). Monitoring is usually done informally, without a specific forms or questionnaires.

Annual or semi-annual reassessments are done to assure that clients remain eligible and that the services are appropriate. Reassessments involve a complete comprehensive assessment, usually using the same form as the initial assessment or in some programs an abbreviated version.

2.3.2 Case Managers are Situated in Community-Based Long-Term Care Programs

Case management in community-based long-term care is used by many current programs to determine eligibility and allocate services. In many programs, case managers also coordinate services, monitor services and clients, and advocate on their clients' behalf. However, the need for these roles to be performed predates our current programs (Applebaum & Austin, 1990; Netting, 1992). The fragmented and complex delivery system creates obstacles for disabled persons to negotiate. People who need long-term care frequently require services from multiple providers. Finally, for the poor, funding for needed services may come from many different sources. Case management is thus viewed by policy makers as a way to facilitate service delivery without dramatically changing the delivery system itself. Publicly funded programs (e.g., Medicaid waiver programs) are typically designed to, in principle, enable case managers to authorize or purchase services from the existing network of providers. We might expect case managers working within such programs to be flexible and open to multiple alternative ways of arranging support for their clients. However, these programs must define the

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target population for services, the types of services they can purchase, and who can provide those services. These definitions must be consistent with state and federal laws and regulations.

Finally, case managers and case management agencies exist outside the framework of particular funding programs. Indeed, many of the agencies that provide case management services to public programs under contract are charitable and social service agencies with a tradition of advocacy. There is also a growing market of private, free-standing, fee-for service case managers that serve the well-to-do. Many agencies that provide long-term care services use case management in an administrative capacity. However, for the purpose of this research, it is sufficient to note that case management in publicly funded programs must play by the rules of those programs.

2.3.3 Case Management Under Medicaid Waivers

In waiver programs, the actual determination of eligibility for services is done by case managers who work in local non-profit agencies, state units on aging or units of local government (Justice, 1993). Case managers typically visit clients in their own homes, conduct service eligibility assessments and collect financial information. Service eligibility is usually determined by the case manager, however financial eligibility is officially determined by state Medicaid offices.

Out of 42 waiver programs surveyed, 19 use a team approach to client assessment (Justice 1993). In these programs, both a social worker and a nurse will visit the client to conduct an assessment. This may take place during the same visit or on subsequent visits.

Information from the service eligibility assessment is then used to determine the type and amount of services the client is eligible to receive. This is referred to as the 'level of care' (O'KEEFE, 1996). In some states an additional assessment tool is used to determine the level of care. The rationale given for this is that information about the client's health and environment may be important to care arrangements, but irrelevant to the question of eligibility. In 14 waiver programs, separate staff perform ongoing case management tasks and assessments (Justice,

1993).

All clients served through Medicaid waiver programs are required to have written care plans, which are typically developed by case managers (Justice, 1993). Care plans typically specify the type and amount of services, the provider and the duration. Each state program has different rules, regulations and standards governing this process. Examples include policies regarding client choice and the maximum amount of services that can be authorized.

Case management is provided by a range of different organizations across the state waiver programs. These include county health or social service departments, Area Agencies on Aging (AAAs), state units on aging, private non-profit agencies, and home health agencies.

Table 2.3 shows the type of agencies used in 11 selected states involved in the present study.

2.3.4 Qualifications of Case Managers

People who work as case managers come from a variety of educational and work backgrounds. Historically there have not been educational programs designed to train case managers (Haw, 1995). Most case managers learn on the job at the agency where they work (Rothman, 1992). Recently, attempts to develop comprehensive guidelines for case management practice have sketched out general goals and principles for good practice (Geron & Chassler, 1994a; Geron & Chassler, 1994b; Geron & Chassler, 1995) and problem oriented strategies (Quinn, 1993).

Case managers who work in Medicaid waiver programs are required to meet minimum levels of education and experience (Justice, 1993). Most states require case managers to hold either a bachelors degree or be a registered nurse and have from one to three years of experience in human service, work with the elderly or in their field (e.g., social work or nursing). Table 2.4 shows the requirements for case managers in the 11 states selected for the present study.

Training for new case managers and in-service training for experienced staff is provided either at the local agency level or by state agencies. Training typically covers two areas. The

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first is intake, assessment, care planning, service authorization, monitoring and reassessment. These job functions implement state policies regarding eligibility requirements, benefit levels, and program management, hence the training tends to be structured and formal (Justice, 1993). The second area relates to the clinical knowledge needed by case managers. This may include the physiological and psychological aspects of aging and chronic illness, physical and cognitive disability, medication use by the elderly (Justice, 1993).

Finally, an effort has been made recently to credential case managers through testing and certification (Bartelstone, King, White & Whitman, 1996). Case managers who pass a standardized test can be certified by the National Academy of Certified Care Managers. The test is available nationwide to individuals who have been working in case management. It is not intended an educational tool or as an entry requirement for the profession; rather it is a certificate that indicates the individual has achieved a certain level of knowledge (and presumably competence) about case management tasks and roles.

2.4 Case Manager Decision Making

The proposed research will investigate issues that affect care planning decisions. While this is only one of many case management functions, it is one that has not been well studied (Abrahams, 1989). The literature on case manager decision making includes practical handbooks and guidelines, but little empirical research. Several key issues emerge. First, case managers are situated in programs that purchase, arrange or provide publicly funded community-based long-term care with particular eligibility, benefit and organizational structures. The features of the program in which they work may affect care plan recommendation for individual clients. Second, while there is some evidence that individual case managers will arrive at different recommendations for the same clients, very little is known about what individual characteristics are associated with variation.

2.4.1 General Framework for Case Manager Decision Making

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Abrahams et al. (1989) provide a framework for understanding case manager decision making. They propose that case managers filter client functional and medical needs through the eligibility criteria and the benefit structure of the program where they work. Informal care and service system options (which may include the type of services and amount of resources) are seen as independent factors that are combined with needs to form a care plan. This is consistent with the definition of care planning as the process of translating client needs into a set of service recommendations that meet those needs.

Care planning is an iterative process, both in the short and the long term (Schneider, 1988). In the short term, that is the initial care planning session, the case manager negotiates with the client and informal caregivers to arrive at agreement about the clients' care needs and how they will be met. Possible solutions proposed by the case manager will be discussed and modified until agreement is reached. Quinn (1993) points out that care plan decisions are ultimately made by the client. It is the role of the case manager to inform the client of the available options and possible solutions. Although, by virtue of experience, superior information and control over resources, case managers can influence what clients can choose from and may lead clients to 'choose' one option over another. Case managers may also engage family members support to help persuade clients (Clemens, 1994).

In the long term, the case manager will monitor the case and adjust the care plan as needed (Schneider, 1982). The success of long-term adjustments depend on program factors such as frequency of client contact and continuity of staff.

Schneider (1988) points out that care plans are constrained by available resources. Resources may include informal support, the supply of formal providers in the community, and program resources to purchase services. In programs where case managers also perform a gatekeeping role, the responsibility for cost consciousness is increased (Quinn, 1993). Case managers may thus face situations where, in their professional judgment, the available resources do not allow the clients' care needs to be met. It may not be possible to practically and safely

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maintain a client in the community who is formally eligible for services based on the assessment and eligibility criteria. Depending on the program, a client may or may not continue to receive case management if they are not receiving in-home services.

Case managers are involved in making decisions about whether their clients can no longer be served in the community and must be placed in a nursing home (Quinn, 1993). This involvement may be direct, arising during the initial assessment and eligibility determination, or indirect, through their ongoing relationship with the client and his or her family. Analysis of the experience of Connecticut's waiver program reveals that of 4797 persons screened, 8% (375) did not receive services because they were expected to be placed in nursing homes (Liu, Hanson & Coughlin, 1995). And nearly twice that number, 727 (15%) were not served because the expected cost of their care exceeded the program's cost caps. The heavy involvement of case managers in nursing home placement for program participants is highlighted by the finding that 10% of clients were institutionalized within 3 months of intake, and 22% by 12 months (Liu, Hanson & Coughlin, 1995). This suggests that case managers, while undertaking their ongoing monitoring of cases, must continually reassess the appropriateness of continued community living.

A final point about case manager decision making is that although there have been major investments in assessment technology, states still rely on professional judgment as part of the eligibility process. And although there have been recent efforts to develop guidelines for care planning, as Austin (1981) points out, this remains a process where agencies rely on professional judgment. Research into the planning process therefore requires a methodology that can identify the influence of individual judgment process on decisions.

2.4.2 Research on Effects of Program Features on Case Manager Decision Making

The empirical literature on the effect of program features on case manager's decisions is limited to evaluations of a number of demonstration projects. These demonstration projects typically provided case management in conjunction with expanded benefits for community-based

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long-term care. However, few of the projects were intended to directly study variation in case management itself (Kemper, 1990). Also, these projects were targeted at different populations. As a result, the studies may be of limited generalizability and applicability to Medicaid waiver programs.

An example of the effects of eligibility definitions and program organization on case manager decision making is found in the experience of the Social Health Maintenance Organization (S/HMO) (Abrahams, 1989). The S/HMO was a federally funded demonstration project that integrated funding for acute and long-term care services for the elderly under a capitated, prepaid health plan (Yordi, 1988). The four sites, located in different states, had different eligibility criteria for long-term care services based in part on differences between state nursing home eligibility requirements and programmatic decisions about whom to serve (Abrahams, 1989). As a result, when case managers from the four sites were presented with the same seven client charts, two of the clients would have been ineligible at two of the sites, and three of the clients would not have had care plans developed at least one site (not always the same site). The care plans themselves varied widely across sites. The site in the state with the narrowest eligibility rules certified only five out of seven of the cases, while the sites in states that incorporated clinical judgment into the certification certified all seven cases.

Examination of the proposed care plans for these seven cases led the authors to conclude that use of annual rather than monthly budgets at one site was associated with a more episodic approach to practice (Abrahams, 1989). This allowed case managers to respond to a short-term heavy need for care by exceeding the monthly average. The other three sites stayed within their required monthly budgets, reflecting what the authors termed, a 'maintenance' approach (Abrahams, 1989).

Evidence of the effect of availability of resources on case managers' perception of client problems was identified in the On Lok Senior Health Services Program (Hennessy & Shen, 1986; Hennessy, 1993). On Lok is a consolidated long-term care program in which health and socially

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oriented services are provided by the same organization (Ansak & Zawadski, 1984). Case management is done using an interdisciplinary team approach that includes social workers, nurses, therapists and physicians. Using an experimental approach, case vignettes were generated and given to case managers that described clients of varying levels of functional, health and cognitive status, as well as the amount of resources available to serve an individual in the community. For each vignette, case managers rated the level of risk that a particular client could not be maintained in the community. As the level of resources decreased, the case managers' assessment of risk increased while controlling for client functional, health and cognitive status (Hennessy, 1993). Hennessy did not address the issue of consistency within individual case managers.

The demonstration project that most closely resembles the current Medicaid waiver programs is the National Long-Term Care Channeling Demonstration (Channeling). In this project, two variants of case management were implemented: a basic model which emphasized care coordination and 'gap filling', and a financial control model which authorized case managers to purchase services (Carcagno and Kemper, 1988). The difference in authority and responsibility under the two models appears to have led to differences in case manager behavior (Phillips, Kemper & Applebaum, 1988). Specifically, case managers in the financial control model identified more problems with the physical and mental functioning of their clients, while case managers in the basic model appear to have identified a broader range of problems in independent living. Financial control case managers also reported spending a greater proportion of their time involved in relations with provider agencies, whereas basic model case managers spent more time working with informal caregivers.

In Channeling, the method for calculating client budgets and the organizational milieu of the project seemed to affect case managers' judgment, leading to liberal application of the eligibility requirements (Carcagno et al., 1986; Kemper, 1990). Each local case management agency was required to keep average expenditures below 60% of a nursing home stay. While it

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was permissible for individual clients to have care plans that exceeded this amount, in practice this rarely happened. This created an incentive for case managers to keep expenditures down by admitting clients who were relatively less disabled, and hence less expensive. The aggregate 60% limit became a de facto individual limit (Kemper, 1990). Analysis of client assessment data revealed that 20% of clients did not meet the formal eligibility criteria. However, only 5% were terminated from the project (Carcagno et al., 1986).

In addition to incentives created by the budgeting system, organizational factors may have also affected the accuracy of targeting. First was the reliance on professional judgment. The case managers involved with the project indicated that although some clients were not technically eligible, they were indeed at risk of institutionalization and needed services. In the case managers' opinion, it would have been poor professional practice to allow such individuals to deteriorate to the point that they were technically eligible (Carcagno et al., 1986). A second factor was that during the early stages of the demonstration the case managers responsible for enrolling elderly individuals into the study were under heavy pressure to reach their target caseloads. After having invested the time to conduct the complete assessment (usually at least an hour), they had an incentive to accept the clients for services. Finally, having a caseload that contained some proportion of less disabled risk clients reduced the burden on individual case managers (Carcagno et al., 1986). All in all, these organizational factors appear to have contributed to errors in eligibility determination and inappropriate retention of ineligible clients.

A program's policy on incorporating informal care into eligibility and allocation rules may also affect case managers' decisions. While some long-term care programs use (lack of) informal care as explicit eligibility criteria, as a general rule case managers do not replace services already in place unless they believe the caregiver is unreliable, poorly skilled, abusive or neglectful. This can lead to inequity, because clients with more need may get less service because they have intact social support systems (Doty, 1995).

In summary, there is evidence that the amount of authority case managers have over

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services can affect the types of problems they perceive. In the extreme, a case manager working in a provider agency may tend to see all problems in terms of the available menu of services. There is also a potentially strong conflict of interest in having authority to allocate public funds to your own (private sector) provider agency. Second, the importance of eligibility criteria in decision making demonstrates that case management decision making is bound up in the specifics of the program in which it exists. Related to this is the incorporation of informal support into the eligibility criteria (making eligibility less related more to unmet need than disability or health) and the allocation decision (leading to inequitable distribution of public resources). Policies which rely on professional judgment may lead to inefficient targeting and allocation of services. Third, the method of calculating budgets may create incentives to manipulate the caseload to include a mix of more and less disabled clients and may affect the overall approach to service allocation.

2.4.3 Effect of Case Manager Characteristics on Decision Making

There is a limited body of empirical research into the effect of individual case manager characteristics on decision making. Wilcox and Taber (1990) examined individual case managers' assessments of the availability of informal care for a client and caregiver in a videotaped interview. They found that the case managers varied considerably in the amount of informal help they perceived to be available. However, there was no association reported between the age or profession of the assessor. Nor was there any association between perceived availability of informal care and a number of scales designed to tap case managers' values for familial or societal responsibility.

Austin and Seidl (1981) compared functional status assessments made by case managers from the Wisconsin Community Care Organization (CCO) to ratings made by an outside panel. The authors found that the CCO staff had low levels of agreement with one another and they consistently rated the risk of institutionalization higher than the outside panel.

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The authors point out that pressure existed within the CCO program to identify and serve high risk clients. This may lead case managers to overstate the seriousness of their client's condition in order to ensure the program will be cost-effective and that marginal clients would be able to receive services (Seidl, Applebaum, Austin & Mahoney, 1983). These findings, while suggestive of wide variation in case management practice, do not address care planning, and do not allow conclusions to be drawn about the differences among the staff case managers themselves (e.g., why was there poor agreement?).

Hennessy (1993) used experimental methods to examine risk assessments and care plan recommendations of case managers working at On Lok. On Lok is a consolidated long-term care program in which health and socially oriented services are provided by the same organization (Ansak & Zawadski, 1984). Case management is done using an interdisciplinary team approach that includes social workers, nurses, therapists and physicians. Case vignettes were generated and given to case managers that described clients of varying levels of functional, health and cognitive status, as well as the amount of resources available to serve an individual in the community. For each vignette, case managers rated the level of risk that a particular client could not be maintained in the community. The results showed that case managers with social work training, as opposed to medicine, nursing or therapy, and those who had worked longer at the agency, were somewhat less likely to recommend a more intensive care plan (Hennessy, 1993). These findings are limited, however, due to the particular nature of the setting in which data were collected.

In summary, while there is general acknowledgment of the importance of individual case manager differences and professional judgment, there has been little research on the subject. The studies by Wilcox and Taber (1993) and by Austin and Seidl (1981) are based on programs similar to current Medicaid waiver programs. From these it may be anticipated that there are differences based on the profession and level of experience in terms of case managers' perceptions of client problems. While assessment provides the data for allocating services,

there above studies do not provide estimates of the magnitude or sources of variation in care planning in Medicaid waiver programs.

2.5 Ethical Issues in Case Manager Decision Making

This study is concerned with ethical issues faced by case managers when authorizing publicly funded care for disabled elderly living in their own homes the community. Ethical issues that may arise for direct care workers or family members involved with the disabled elderly are beyond the scope of this dissertation.

Long-term care, by its nature, is intimate and personal. When care is delivered in peoples' own homes by a combination of family, friends and paid providers, there is potential for tension and conflict (Collopy, 1990). When major decisions need to be made, such as whether to have a risky medical treatment, people rely upon the advice and skills of professionals. However, the mundane tasks of daily living do not draw upon special knowledge or training, only the personal patterns of habit and lifestyle. The importance of personal autonomy over the performance of these tasks needs to be underscored, and a critical distinction may be drawn between decisional autonomy and executional autonomy (Collopy 1990). When an individual needs assistance in performing these tasks, he or she is the expert in how they should be done. It is possible to retain decisional capacity in the face of disability, or loss of the ability to execute one's own autonomous desires.

Case managers who work in Medicaid waiver programs, as well as those who work in other long-term care systems, have multiple responsibilities: they are responsible to the program and to the individual client. Responsibility to the program includes working toward achieving the program's goals, keeping within the required budget and following program rules (Browdie, 1992). Responsibility to the client is also complex: case managers are concerned with arranging services to maintain or improve the health and safety of the client and are ethically obligated to respect the individual's values and preferences (Wetle, 1992; Kane; 1992). When a client's

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preferences are potentially detrimental to their health or safety, then the case manager must reconcile these two conflicting responsibilities. And when clients expect family members to provide care that they are unwilling or uncomfortable doing, case managers can become embroiled in tense personal relationships (Wetle, 1992).

The responsibilities of case managers are consistent with three main principles of bioethics: justice, respect for autonomy and beneficence. The principle of justice regulates the design and goals of programs (e.g., who is eligible for benefits), and the distribution of benefits among eligible persons (e.g., persons with similar need receive similar benefits). The limits imposed on case managers by a responsibility for cost control may create an ethical responsibility to conserve scarce resources and to assure that one clients' consumption does not interfere with the resources available for another. The question of cost control is addressed below, however, a full examination of justice in case management is beyond the scope of the present study.

The principle of respect for autonomy means that people should be allowed to lead their lives in the way they wish, without interference. The freedom from interference is referred to as 'negative' autonomy, and the freedom to pursue certain acts is 'positive' autonomy. Under a libertarian point of view, interference with a person's autonomous desires is not permitted unless that person's exercise of autonomy threatens the rights of another.

Applying the principle of respect for autonomy and long-term care, and in health care generally, have led to several limitations and criticisms of the principle. The notion of autonomy is typically built upon the ideal of isolated, rational decision makers who consider their options and act in their own best interest. However, it is not clear that this is a good description of how people behave. When deciding about medical treatments, for example, people often rely on family members for advice and assistance (Collopy, 1988; Kapp, 1991). Dallas High (1991) points out that family members have an interest in decisions about care for a specific individual. And, similarly, the individual takes his or her family into considerations when making decisions

about themselves.

Kane (1992) points out that respect for autonomy does not provide a clear guideline for case managers in the case when individuals are not competent to make decisions for themselves. The assessment of capacity to make judgments is difficult, and often subjective. While in familiar surroundings, people with some level of dementia may find cues and reminders that help them perform necessary tasks. But the same individual in a strange setting may be unable to perform even the most basic life activities.

In long-term care, the presence of physical impairment makes application of respect for autonomy difficult (Kane, 1992; Collopy, 1988). Collopy (1988) distinguishes between decisional autonomy and executorial autonomy. People with physical disability may be able to make decisions for themselves, but unable to carry those decisions out. In a caregiving situation, family members and paid providers will perform certain tasks on behalf of the client, however it is not clear how far their obligation extends to implement the desires of the individual.

The principle of beneficence, which means 'doing good', takes practical form in the case manager doing what, in her professional opinion, furthers the health and safety of the client. Considering also the importance of personal autonomy, beneficence must also be defined in terms of the client's perception of good. Nancy Dubler (1992) suggests that the case manager should act "to the limit of professional ability to provide for the client's best interests and needs *as the client defines them* (italics added)." Two issues immediately arise. First, the requirement to pursue the clients' perception of what is good makes the role of the case manager more like that of an agent or representative than a gatekeeper. Under this interpretation, however, successful case management requires that case managers obtain a high level of familiarity not only with their clients' desires and preferences, but world view. Research by Kane, Penrod, and Kivnick (1993) suggests that case managers may lack the tools to systematically learn about the values and preferences of each and every client.

The second issue is that case managers' perceptions and clients' perceptions of what is

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good may come into conflict. The paradigmatic example is of a client who refuses services or is reluctant to consider moving to a nursing home. Case managers must strive to balance these two sides of beneficence. In practice, case managers' concerns about safety may override clients values and preferences (Kane, Penrod & Kivnick, 1994).

This may stem in part from the fact that many case managers come from a social work or nursing background (Justice, 1993). The National Association of Social Workers Code of Ethics (1990) states that "The social worker's primary responsibility is . . . to maximize client self-determination", however it also pledges social workers to "safeguard the interests and rights of clients" and promote "client best interest" (Clemens et al., 1994). Likewise, the American Nurses' Association code states as a first principle that "Each client has the moral right to determine what will be done with his/her own person (ANA, 1985)." Consistent with this principle is an emphasis on truth-telling and informed consent. However, the first paragraph of the code states that "Nurses [therefore] must take all reasonable means to protect and preserve human life when there is hope of recovery or reasonable hope of benefit from life-prolonging treatment."

Case managers who look to their profession for guidance may thus see the balance already tipped in favor of safety, nurses more strongly than social workers. It is not clear what sources of guidance case managers without professional training draw upon.

Finally, a case managers' assessment of client needs may lead to the conclusion that the available resources are inadequate. In this situation, several dilemmas can arise. If the case manager or the program refuses to serve the client, this may protect the agency budget, and may limit any liability that might stem from providing inadequate care. But it can lead to greater harm for the client. A second issue is that, in Medicaid waiver programs in particular, while a nursing home placement may preserve the budget for client services, it is still a public expenditure, and a potentially much larger one.

Two recent empirical studies in case management shed light on the types of ethical conflicts faced by case managers (Kane, Penrod & Kivnick, 1993) and the strategies they use to

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reconcile conflicting principles (Clemens, et al. 1994; Hennessy, 1988).

Kane, Penrod and Kivnick (1993) surveyed 251 case managers about the type of ethical conflicts they face. The issues cited most frequently had to do with admission to nursing homes or board and care homes (29%), followed by client safety (28%) and confidentiality (20%). Nearly half (49%) of case managers had experienced ethical conflicts when the family and the client or case manager disagree about nursing home placement. About one third (34%) had experienced conflict when client safety was viewed by the case manager as more important than other goals. The most common methods for resolving ethical conflicts were to discuss the issue with supervisors (68%), colleagues (39%) or in care conferences (17%). A few agencies had legal counsel (4%) or training on specific issue (4%) available, however the majority did not have institutionalized or systematic processes for resolving ethical conflicts (Kane, Penrod & Kivnick, 1993).

Clemens et al. (1994) examined how case managers reconcile conflicting roles. The authors found apparent contradictions between what case managers identified as guiding ethical principles and how they treated individual cases. For instance, a key strategy used to operationalize respect for autonomy is to provide the client with meaningful and informed choices (Schneider, 1988). However, qualitative analysis of self-reported behavior with regard to actual cases revealed that case managers use strategies such as persuasion and coercion to convince clients about the need to accept nursing home placement (Clemens et al. 1994). Similar findings were reported by Hennessy (1988), including tactics of strategically withdrawing services to precipitate a placement decision. The findings of Clemens et al. (1994) and Hennessy (1988) suggest strongly that case managers decide that beneficence and concern for client safety often outweigh autonomy and respect for client self-determination in long-term care decision making.

In summary, case managers face complex ethical challenges as part of their routine work with the disabled elderly. Respect for autonomy, concern for safety, and responsibility for

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cost control must all be held in balance:

Client self-determination must be balanced against competing pressures... from families and care providers to ensure client safety through [nursing home] placement, pressures from the reimbursement system to contain costs, and pressures from professional and legal responsibility to promote client well-being and protection from harm (Clemens, et. al., 1994).

Case managers must also be alert to conflict within families over caregiving roles and expectations. However, as Collopy (1990) points out, there is no "ready formula for determining how the autonomy and interests of family members should counterbalance those of the elderly relative receiving care at home.

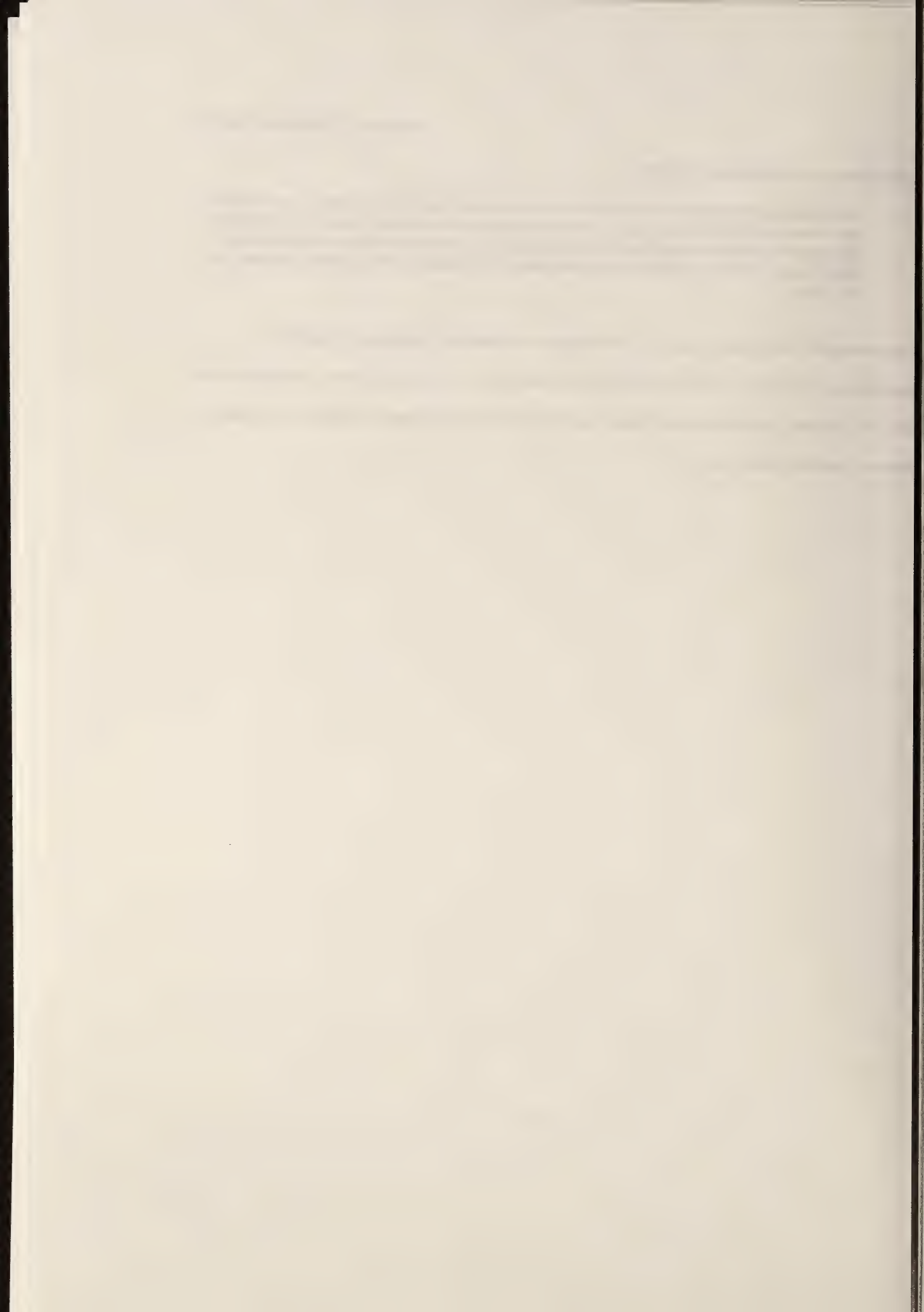


Table 2.1 Types of Eligibility Criteria Used in 11 Selected State-Wide Waiver Programs

State	Type of criteria	Medical/ Nursing	Mental Impairments	Physical Impairments	ADL	IADL	Informal Support	Criteria
California	def./guideline	5	2	3	6	8	yes	Need out-of-home protective living, nursing
Colorado	minimum score	8	2	4	6	8	no	score of 20, based on ADL, IADL, impairment; or need for skilled care
Connecticut	minimum # of impairments	6	2	0	5	2	yes	3 critical care needs (ADL or IADL) or cognitive/behavioral impairment
Florida	def./guideline	7	3	3	6	8	yes	require medical or nursing supervision for health or ADL needs
Georgia	minimum # of impairments	8	2	3	5	1	no	of medical condition, 1 nursing service, and 1 cognitive or functional impairment
Indiana	minimum # of impairments	8	2	3	6	0	no	at least 3 of 14 impairments
Massachusetts	minimum # of impairments	5	2	1	5	0	no	one of 19 nursing or rehab services, 2 ADLs
Minnesota	minimum # of impairments	7	2	3	6	0	no	must meet minimum case mix based on medical and functional criteria
Ohio	minimum # of impairments	5	1	1	6	8	no	3 IADLs + 2 ADLs or 3 IADLs, 1 ADL + medication admin., 24 supervision or 1 nursing service
Washington	minimum # of impairments	2	1	1	4	0	no	2 ADLs or 1 ADL and supervision
Wisconsin	minimum # of impairments	8	3	2	6	7	yes	1 severe or 2 substantial medical needs, 2 IADL + 2 ADLs or behavioral problems and poor informal support

Source: O'Keefe, 1996.

Table 2.2 Services and Alternate Residential Settings Where Waiver Services May be Provided in 11 Selected States

State	Home-maker	Home Health	Respite	Personal Care	Skilled Nursing	Transportation	Chore	Companion	Environmental Modifications	Medical Equipment	Personal Emergency Response System	Counseling	Private Duty Nursing	Adult Day Health	Alternative Setting
CA		✓		✓	✓	✓	✓		✓		✓	✓		✓	None
CO	✓		✓	✓		✓			✓		✓	✓			Alternative care facility
CT	✓					✓	✓	✓			✓	✓		✓	Foster care
FL	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	Assisted living
GA		✓	✓	✓	✓		✓	✓			✓			✓	Alternative living
IN	✓		✓	✓					✓					✓	None
MA	✓		✓				✓							✓	None
MN	✓	✓	✓				✓	✓		✓				✓	Foster care; Residential care; Assisted living
OH	✓		✓	✓		✓	✓		✓	✓		✓		✓	None
WA		✓	✓	✓	✓	✓			✓		✓			✓	Adult family home care; Assisted living; Special living facility
WI			✓	✓	✓	✓			✓					✓	None

Source: APWA, unpublished data.

Table 2.3 Types of Agencies That Provide Case Management

State	Type of Agencies
California	6 County Social Service Agencies; 5 AAA; 9 PNP; 2 university systems
Colorado	23 County Social Service Agencies; 1 AAA; 3 PNP; 1 HH; 14 County Nursing services, 2 hospital districts
Connecticut	1 PNP
Florida	64 PNP; 3 divisions of local government
Georgia	1 County Social Service Agency; 3 AAAs; 11 PNPs; 3 individual case managers
Indiana	16 AAAs
Massachusetts	20 AAAs; 7 PNPs
Minnesota	87 County Departments of Social Service
Ohio	12 AAAs; 1 PNP
Washington	49 local offices of state Aging & Adult Services Administration
Wisconsin	78 county government agencies

AAA = Area Agency on Aging; PNP = Private Non-Profit; HH = Home Health
Source: Justice, 1991

Table 2.4 Minimum Educational and Training Requirements for Case Managers

State	Requirement
California	RN & 3 years experience; BA in social work, psychology, counseling, rehabilitation, gerontology or sociology & 2 years experience; Masters & 1 year experience
Colorado	BA in human behavioral science or work experience
Connecticut	BA in human services & 2 years experience; BSW & 1 year experience; MSW; RN & 4 years experience; or RN with Bachelors & 1 year experience
Florida	Bachelors in social work, nursing, sociology, psychology, or other field or experience
Georgia	registered nurse with 2 years experience; bachelors in social work, sociology, psychology or other field & 2 years experience
Indiana	bachelors degree & 2 years experience; registered nurse & 1 year experience; or bachelors in social work, psychology, gerontology, sociology, counseling or nursing
Massachusetts	bachelors degree or comparable experience
Minnesota	public health nurse; social worker meeting merit system of county/state
Ohio	registered nurse & 1 year experience; bachelors in social work with social work license & 1 year experience
Washington	bachelors & 4 years experience; bachelors in behavioral or health sciences & 2 years experience; masters in behavioral or health sciences & 1 years experience;
Wisconsin	set locally - experience similar to bachelors degree & 1 year experience

Source: Justice, 1993

CHAPTER 3: METHODS

3.1 Introduction

The first purpose of this study is to examine the effects of client preferences on case managers care plan recommendations while controlling for other factors known to put disabled elderly persons at risk of using HCBS and nursing home care (e.g., limited physical and cognitive function, poor informal support). The second purpose of this study is to examine variation in care plan recommendations between individual case managers and between case managers from different local case management agencies, while controlling for client characteristics.

A national sample of case managers was generated by contacting state-wide long-term care programs and local case management agencies. Each case manager was sent a survey that asked for care planning decisions based on a set of case studies, or vignettes, that described typical long-term care clients. Descriptive data were collected from agencies and case managers themselves. Analysis was done using multilevel modeling software capable of handling problems with multinomial as well as continuous dependent variables.

The following sections present the theoretical model, the analytic variables, sample, data collection, and analytic procedures.

3.2 Theoretical Model of Case Manager Decision Making

This section presents the theoretical model of case manager decision making. General hypotheses motivated by the main research question are presented. Hypotheses about the effects of client, case manager and agency variables on the outcomes of interest are presented below under the appropriate section.

3.2.1 Structure of the Decision

Case managers make recommendations about the setting, type and amount of services based on the needs and preferences of the client, the available resources, their own experience and professional judgment and the rules (written or otherwise) of their agency:

$$\text{Recommendation} = f(\text{Client Factors, Case Manager Factors, Agency Factors}).$$

The services and options available to case managers vary from program to program and even between local areas in the same state-wide program. However, across all settings, case managers assess clients needs and resources and develop care plans that specify the type and amount of services that will be provided.

The decision to recommend home care or an out-of-home placement is considered to be lexicographic for the purposes of this study (see Figure 3.1). A lexicographic process is one in which certain steps logically precede others. For example, one first decides to buy a car, then selects the color. Case managers first decide if they need to intervene in a clients' case (labeled as 'A') or if it is more appropriate to continue in a monitoring mode only (outcome 1). If they judge that some intervention is necessary, they then determine the setting (labeled as 'B'): in-home services (outcome 2) or an out of home placement (outcomes 3 or 4, combined). Based on the state program and the regional area in which they work, case managers may have one or more residential alternatives to nursing homes to offer a client who cannot be maintained safely at home (labeled as 'C'). If the case manager decides that home care services are appropriate,

then he or she will develop a care plan that specifies the type and amount of home care that the client will receive (outcome 2). This is referred to as the 'nested' model.

The lexicographic process described above assumes that at each stage, case managers make pairwise comparisons. Monitoring is compared to intervening. Home care is compared to an out-of-home placement. A nursing home is compared to a residential alternative. Issue may be taken with the assumption that case managers compare home care to any type of out-of-home placement. An alternative assumption is that there is an underlying dimension along which each intervention can be arrayed that may be called 'intrusiveness', or 'protection'. A nursing home can be said to offer the highest level of safety (e.g., 24 hour availability of skilled care), followed by a group home setting where full time supervision is available, followed by living at home with only part time supervision or care. The intrusiveness of the care system also decreases as we move from nursing home to home care. This would give rise to an 'ordered' model (outcomes 1,2,3,4 are ordered in increasing intrusiveness/safety).

On the basis of the ordered model, living at home with home care is lower on the intrusiveness/safety dimension than any out-of-home placement. However, if case managers perceive these interventions as ordered, then they would compare home care directly to a residential setting, and a residential setting to a nursing home. By combining residential alternative and nursing home into 'out-of-home' placement, the model glosses over these distinctions.

Both the nested model and the ordered model make certain assumptions; this study is not designed to directly test these assumptions. It may be that a mixture of these models provides the best explanation, however this is beyond the scope of the present study. Relaxing the second assumption, that there is an ordered dimension to the possible care plan recommendations, gives rise to a third possibility: the 'unordered' model. Under this model, once case managers have made the decision to intervene with a client, they compare each alternative to one another and choose the most appropriate one. (For estimation purposes a reference

category must be chosen.) The assumption that there is an ordered dimension of intrusiveness/safety underlies other research in this area (Hennessy, 1993), however it is a question that best needs to be answered empirically. In particular, case managers from different program and policy environments, and working within different regulatory structures, may weight residential settings differently. Such alternative settings are defined differently in different states, so it would be necessary to develop a methodology that controlled for these differences.

The first assumption seems to have face validity. An out-of-home placement is qualitatively different than in-home services. And the decision to recommend such a placement may indeed precede a conclusion about the type of placement. Homes are deeply important to people for emotional, social and economic reasons; home-ownership is deeply held cultural value. When measured by the impact such a recommendation can have on the client, coming to the conclusion that one should suggest leaving a home where he or she may have lived for decades, raised a family, and paid the bills is clearly momentous. It therefore should be treated as a distinct step, followed by a decision about the type of placement.

For the purpose of this study, two sets of analyses will be performed. Both the nested model and the unordered model will be estimated and compared side by side. This approach will not allow firm conclusions to be drawn over which model is more correct. Nevertheless, the inferences that may be drawn from each are both important and relevant to the overall research questions.

In addition to being lexicographic, case manager decision making is an iterative process. At the initial stage of working with a client, the case manager will develop a provisional care plan recommendation, suggest it to the client and family then negotiate to reach an acceptable course of action. They will proceed through each of the steps in Figure 3.1, then reconsider the relevant factors and, if necessary, revise their decisions. After the initial decisions and care plan has been made, case managers monitor their clients and are responsive to changing needs, resources and preferences. The present study, however, deals only with the initial decision.

At each stage A, B and C of the decision tree in Figure 3.1, case managers respond to client preferences, risk factors and available resources. The first research question generates the following hypothesis (the null is omitted because it is trivial):

H_1 Case managers' care plan recommendations are a function of client preferences, risk factors and the available resources.

Directional hypotheses about specific client characteristics are presented in Section 3.4.2, below.

3.2.2 Case Manager Decision Making as a Hierarchical System

The individual experience and background of the case managers and the rules of the agencies where they work affect decisions for individual cases. This follows from the observation that case manager decision making takes place in a natural hierarchy, analogous to a teacher in a school (Figure 3.2). Individual case managers are responsible for a number of clients (their caseload); each group of clients is thus 'nested' within her case manager, much like students within classrooms. Case managers work together in local agencies. They are thus nested within the organizational context in which they work on a daily basis, similar to teachers working in the same school building. Individual case management agencies are relatively autonomous in their hiring and firing. While agencies funded by the same state-wide LTC program are follow the same rules and regulations, assessment and care planning decisions are effectively decentralized and take place at the local level. It is a goal of this research to determine the proportion of variation in decision making attributable to the individual and the organization.

Individual case managers are presumed to make decisions consistently over time, weighting client factors similarly in each case. Each individual thus has a set of decision rules or weights that guide his or her practice. These may be explicit rules or unconscious patterns that

they follow. In case management, as in other fields, these rules are learned over time in the social environment of the workplace. New case managers learn what to do on the job. Case management agencies use a combination of group meetings, peer reviews and individual supervision to train new staff and to help individuals make decisions in difficult cases. These social forces lead to shared understandings of their mission and clientele, as well as how to respond to and make decisions for individual cases. Because it is the individual case manager who typically makes care plan recommendations, these shared understandings are inevitably filtered through the individual's background and experience. Each case manager may therefore respond to client preferences, risk and resources somewhat differently, even if they work in the same agency. The purpose of this research is to estimate these weights. Furthermore, variables that measure differences between individuals and agencies may be associated with differences in decision making styles. The null hypothesis, corresponding to the second main research question, is thus:

$H_{2.0}$ All case managers use the same decision making process (i.e.; same intercepts and coefficients);

3.2.3 Modeling Differences in Case Managers' Decision Rules

Previous research in professional decision making has shown that people's decision processes can be adequately modeled with additive functions of the measurable components of the decision. Each stage of the case manager decision making process is modeled as an additive function of variables that measure client preferences, risk factors and the available resources.

Case manager decision making may vary between individuals and agencies in two ways: (1) in the threshold needed to choose a certain action and (2) in the weight placed on specific client characteristics. First, If there is variation in the threshold needed to choose a certain

action, then case managers with a low threshold are more likely to choose that action than those with a high threshold, all other things being equal. Empirically, the threshold is modeled by the intercept term in a multiple regression which is convenient to interpret. Case managers with a high intercept term will be more likely to choose a certain action or prescribe a greater quantity of services all other things being equal.

H_{2,1} Individual case managers have idiosyncratic thresholds for reaching decisions (i.e., different intercepts).

Second, case managers may vary in the weight they place on specific client characteristics. The main aim of this study is to examine differences in the weight case managers place on client preferences.⁴

H_{2,2} Individual case managers have idiosyncratic weights for variables that measure client preferences (i.e., different coefficients).

If variation in the threshold and or decision weights has been identified, that is if there is evidence to accept H_{1,1} and H_{1,2}, then the source of that variation may be explored.

H_{2,3} Differences between individual case managers (in either intercepts or coefficients or both) are associated with measurable characteristics of the individual.

Directional hypotheses for specific case manager characteristics are presented in section 3.4.3, below.

⁴In principle, case managers may place different weight on other client variables such as functional status, cognitive status, or frequency of informal care. For the purpose of the present study is assumed that these factors are weighted the same by all case managers.

Variation between agencies is assumed to affect individual decision making through the thresholds. That is, case managers within the same agency have the same average threshold for reaching a decision. Analogous to hypotheses about individual case managers, specific hypotheses about agencies can be written:

H_{2.4} Averaging across case managers in the same agency, each agency has an idiosyncratic average threshold for reaching decisions (i.e.; different intercepts); and

H_{2.5} Differences between agencies' average thresholds are associated with measurable features of the agencies.

Directional hypotheses for specific agency characteristics are presented in section 3.4.4, below.

3.3 Sample

The following sections describe the sample size estimates, the steps used to generate the sample of agencies and case managers, the instruments used to collect the data, and the survey procedures used.

3.3.1 Sample Frame

The target population for the study was case managers working in case management agencies funded through Medicaid HCBS waivers. However, there are no national listings of case managers or of case management agencies from which to develop a sampling frame. Furthermore, most states do not have rosters of the individual case managers; this information needs to be obtained from the local agencies themselves. Case management agencies are typically either units of state or county government or private non-profit social service agencies under contract to the states. The names and addresses of local agencies therefore needed to be

obtained from each state directly.

The sample frame for this study was therefore developed by selecting state LTC programs and soliciting the names and addresses of local agency directors. The local agencies were then surveyed to collect the names of individual case managers. Random sampling was used when there were more case managers available than needed.

3.3.2 Sample Size Estimation

The required sample size was estimated in advance in order to achieve the study goals with adequate statistical power. In the context of hierarchical models, the general rules for sample size calculation used with traditional OLS can be used as a starting point. When considering traditional OLS regression models, there are two concerns about sample size. First, there should be adequate degrees of freedom for testing hypothesis about the explanatory power of the model. Second, the sample should have adequate power to detect meaningful differences in the variables of interest. However, two features of hierarchical models make specific application difficult. First, estimates need to take into account the nested nature of the data. Second, the methods used to estimate hierarchical models are typically more efficient than OLS (Bryk & Raudenbush, 1992). Specifically, the empirical Bayes estimates of confidence intervals produced by software packages such as HLM (Bryk, Raudenbush et al., 1988) are generally smaller than OLS estimates. Since hierarchical models are typically very complex, there is no straightforward way to determine the impact of design changes on power (Bryk & Raudenbush, p. 203, 1992).

A conservative rule of thumb for sample size estimation is that there should be at least twice as many observations as error degrees of freedom (that is, the number of observations minus the number of parameters). This analysis provides an upper bound for an acceptable sample size. For this estimate, each Level-2 (case manager) and Level-3 (agency) unit can be considered a separate OLS model (Bryk & Raudenbush, p. 53, 1992). In the individual case manager model, it was assumed that there would be 10 variables that describe case managers

plus an intercept, or 11 parameters to estimate. With a sample of 22 vignettes per case manager, there would be 11 error degrees of freedom, satisfying the rule. Similarly, in the agency level model it was assumed that there would be eight variables plus an intercept, or nine parameters to estimate. Hence about 18 case managers per agency would be needed. Recent simulation studies of hierarchical models suggest that designs with relatively small numbers of Level-1 units (e.g. $11 < n < 20$) and large numbers of Level-2 units can achieve adequate power and produce estimates that are not biased (Snijders & Bosker, 1993; Mok, 1995).

Murray & Hannan (1990) provide a formula to estimate the sample needed to detect a meaningful difference in a complex nested sample. This formula is based on the usual sample size calculation with an inflation factor based on the intraclass correlation (ρ).⁵ This analysis provides a lower bound for an acceptable sample size. The Type I and Type II error rates are set at conventional levels (.05 and .80, respectively); the desired meaningful difference is assumed to be .5 points on a 7 point scale, with variance of 5 (based on pilot data, see Appendix A). To calculate the total number of case managers needed, an estimate of $\rho_{CM} = .621$ (based on pilot data), is used. Assuming each case manager rates 15 vignettes, the number needed is 405. Applying the same logic to the agency level ($\rho_{AGENCY} = .061$), and assuming 15 case managers per agency, 78 agencies are needed. If each case manager rates more vignettes, fewer are needed. However, if agencies have fewer than 15 case managers, more agencies will be needed.

It is important to note that the statistical power of the agency level model depends on the number of agencies with an adequate number of case managers per agency, not the total number of case managers. This requirement will tend to increase the number of case managers in the sample well above the minimum that would be needed for analysis of the case manager

⁵ $m = [7.84 * 2\sigma^2(1 + (n-1)ICC)]/[n\Delta^2]$; where m is the number of level 2 units per condition, n is the number of level 1 units per level 2 unit, σ^2 is the variance, and Δ^2 is the hypothesized difference between the two condition means. Each 'condition' can be a level of an independent variable.

level alone. Finally, while not explicitly included in the above calculations, the fact that key agency variables may be set at the state rather than local level implies that a plurality of local agencies is needed from each state. This issue is discussed in more detail below. The overall effect of these requirements is a more conservative, i.e. larger, sample size than may be necessary. Actual power calculations will therefore be included with the results.

3.3.3 Selecting State LTC Programs

The goal in choosing state LTC programs was to identify mature case management agencies with established policies, caseloads, and numbers of case managers. Agencies that operate under more mature state programs were believed to have a range of experienced workers and new hires. In newer, less well established state programs, and in programs with lower caseloads, policies and norms may not be well formulated and the experience level of the case managers will be uniformly lower.

To be included in the present study state programs needed to be in operation for at least three years and have at least 1,000 aged (>65) clients enrolled. The rationale for this inclusion criteria was as follows. Medicaid 1915c waivers last for three years, after which they may be renewed for five years at a time (APWA, unpublished data). When states first apply for waivers, they typically begin small scale demonstration projects that are expanded into state-wide programs. The first year of a waiver cannot generally be considered a complete year. Since clients do not apply all at once on the first day, caseloads are not be stable until the program has been in operation for some time. Arguably, therefore, it is not until after the second year that program administrators have an understanding of the dynamics of the program. Mature programs that do not enroll more than 1,000 per year will not have an adequate number of case managers to support the planned analysis, given that average caseloads are about 50 clients per case manager.

Information on existing Medicaid HCBS Waiver programs that serve the elderly was compiled and used to generate the sample frame (APWA, unpublished data; Folkemer, 1994;

Justice 1991; Justice 1993). Thirty-nine operational state-wide programs that use case management were identified. Ten of these (Delaware, Hawaii, North Dakota, South Dakota, Iowa, Vermont, Montana, Nebraska, Nevada, and Mississippi) served fewer than 1,000 clients. Based on statewide caseload standards (Justice, 1993), these programs did not have enough case managers to support the planned analysis (e.g. fewer than 10 case managers). Dropping these 10 small programs left 29 states with sizeable, established programs

These 29 state LTC programs were categorized according to three factors: whether they use individual case managers or teams, whether or not local agencies were allowed to provide direct, in-home services, and whether the required frequency of client contact was greater than or less than two times a year (see Table 3.1). Within each cell, states were selected at random, taking care to assure that the northeast, southeast, mid-west and west regions of the country were represented. Two states, IL and OR, were excluded because the investigator was involved with an ongoing research project with these states' case management programs.

State LTC program staff from 13 states were contacted by telephone and mail to gain their participation. A roster of local agencies was already available for the state of California. Ten of the remaining 13 states contacted provided directories of local case management agencies. The final sample included 11 state-wide programs.

3.3.4 Selecting Local Agencies

The 11 state programs identified a total of 347 agencies that perform case management. Because the number of case managers per agency was not available at this stage, the decision was made to include all eligible agencies. From this population of agencies, a sample of size $n=253$ was selected using the criteria shown on Table 3.2. In Minnesota and Wisconsin, the agencies were county health or social service departments. Because of the large number of counties in these two states, stratified sampling was used, with the goal of selecting 10 agencies from MSA and non-MSA areas. Due to sampling variation slightly more than 10 were selected. In Colorado, where approximate sizes of local agencies were provided, all agencies with five or

more case managers were included. In Wisconsin, two county agencies (Milwaukee and Dane) were further subdivided into departments that served local areas or contractors; this increased the overall sample size to 263.

The directors of each selected agency were surveyed by mail to provide the names of their case managers and to answer a few questions about their agency. To improve response rate, reminder cards were sent out to each agency director who had not responded within three weeks. Five agencies turned out to be ineligible because they either did not authorize any LTC services or did not serve the elderly. A total of 212 agencies (81%) responded, however one was received too late to be used, reducing the sample size of agencies to 211.

3.3.5 Selecting Case Managers

The 212 agencies provided the names of 3048 case managers. This sample frame was much larger than the minimum number of case managers needed to conduct the analysis at the case manager level. However, in order to conduct the analysis at the agency level, it was necessary to have at least 78 agencies with 15 or more case managers. Hence, the decision was made to sample a large enough number of agencies and case managers per agency so that in the event of poor response rate there would be adequate statistical power. In order to reduce the burden on the staff of larger case management agencies, the following criteria were then used to select individuals for the survey. In agencies with greater than 40 case managers, each individual had a 50% probability of being selected. In agencies with between 18 and 39 case managers, each individual had a 67% chance of being selected; and in agencies with fewer than 18 case managers, all individual were selected. The final sample had 2135 case managers.

Personalized letters were sent to each of the 2135 case managers informing them that they had been selected to participate in the study. The letters indicated that they would receive a survey in the mail. The surveys were mailed approximately four to five weeks later. The survey packet itself included a cover letter with instructions on filling out the survey, information

about a drawing for incentive gifts, a stamped return envelope, a page of information about the study, and a monogrammed pen. About three weeks after mailing the surveys, phone calls were made to all non-responding case managers to remind them to return the survey and to identify any who may need a replacement survey packet. Over a period of four weeks, 1795 phone calls were made. In the ninth week after the surveys were mailed, personalized reminder letters were sent to 945 case managers who had not yet returned a survey.

A total of 1001 surveys were returned. One hundred and sixty-three (163) people refused to participate, 148 turned out to be ineligible (i.e. were not case managers), and 823 did not respond at all. The response rate, correcting for the number of ineligible persons, was therefore 50.4% ($1001/(2135-148)$). While the majority of surveys were returned within the first three months after the mailing, all completed surveys were accepted into the sample. The last survey was returned seven months after the initial mailing.

3.3.6 Case Manager Survey Instruments

The survey instrument had two parts: a series of 18 case vignettes, each with identical questions about the care plan recommendations; and a set of background questions about the individual case manager. To assess face validity, the vignettes and response items were pilot tested on two separate occasions (see Appendix A). The pilot testing demonstrated that the response items covered the typical care planning options that case managers consider, that the thought process used to fill out the survey was similar to actual problem solving, and that the cases described potential clients. An example of the final survey instrument along with other materials included in the survey packet are in Appendix B.

3.3.6.1 Case Vignettes

Ten variables were used to generate the vignettes: preference for family care, preference for paid home care, preference for relocation to nursing home, physical function, cognitive function, medical needs, age, informal support, client financial resources, and agency financial resources. These are the main independent variables for the study. The variables

were operationalized by writing sentences that describe a typical disabled elderly person (see Table 3.3). One sentence corresponded to the 'high' value and one to the 'low' value of each variable. For analysis, the high level was typically coded 1 for analysis and the low value 0. Alternative wordings for each level of the physical function variable were written to reduce the similarity between cases (see Table 3.4).

After each vignette, the case manager was asked a series of questions about his or her decisions in the particular case. All the questions are described here and included in Appendix B, though some are not analyzed as part of this dissertation.

In addition to these 10 variables, the vignettes included text that described factors common to all cases. Specifically, all clients were females who lived alone and all informal caregivers were adult daughters. All clients were described as eligible for services but currently receiving none, and all were described as having occasional bladder incontinence.

Table 3.5 shows a sample vignette, with each variable set to the 'low' level and formatted as it appeared in the actual survey. The sample represents the 'base case', and serves as the reference point for all statistical analyses. The intercept term in any multiple regression with client variables measures the mean of the dependent variable for the base case. For logistic models, the intercept measures the log odds for the base case that the dependent variable will fall into the alternative category rather than the reference category.

Based on the number of variables and levels of each variable in the design, the vignette universe had 2304 possible combinations. In some vignette studies, certain combinations of characteristics are logically impossible, and hence deleted from the sample. This creates a non-orthogonal design which in general is less efficient. In the present study, all variables were purposefully constructed to be orthogonal with one another and produce logically possible combinations. However, some combinations of client characteristics represent client situations that are less plausible than others (e.g., a client with no informal support who stated that she wanted family and friends to help with their care).

Each survey included a simple random sample (with replacement) of 18 vignettes; while it was possible, no survey had more than one example of the same case. This produced a balanced design: each bivariate (and multivariate) contrast of client variables has equal sized cells. In some situations it is desirable to have an unbalanced design. For example, if it is known that the response to the vignettes are skewed toward the top end of the scale, it is reasonable to over-sample (i.e., include more) vignettes that produce low scores (Kuhfeld, Tobias & Garratt, 1994). In the case of a discrete dependent variable, it is preferable to have a uniform distribution of the dependent variable. In the present study, however, there were no prior data available on the distribution of case managers responses that could have been used to calibrate the sample.

In situations where the sample of respondents is small and the universe of possible vignettes is large, analysts will often use fractional designs rather than full designs as in the present study. A fractional design uses a particular sub-sample of the universe of possible vignettes. The size (or fraction) of the sub-sample and the specific cases used must be chosen carefully. In small fractions, there may not be enough observations to disentangle two-way and higher interactions. This is called 'aliasing' (Alexander & Becker, 1978), because specific interactions are 'aliases' for one another. Because the present study required an overly large sample size of case managers in order to estimate the effects of agency characteristics a full rather than a fractional design was used.

3.3.6.2 Vignette Response Items

For each vignette in the survey, case managers were asked to identify the course of action that they would follow (see Appendix B). The options given were: to continue monitoring the client; to arrange an in-home care plan; to suggest relocation to a group home; or to suggest relocation to a nursing home. This question was recoded to become the main dependent variable for the study.

Based on the action chosen, there were a number of additional questions. If the case

manager indicated that they would arrange an in-home care plan or relocation to a group home, then they were asked to specify how much of each type of services they would arrange, staying within the available resources. The service options were personal care, homemaker/chore, and adult day care; the prices and definitions of each service units were printed on the survey. They were also asked how likely they would be to make referrals for home health care and home delivered meals, using a five point scale anchored with 'Definitely Would Not' and 'Definitely Would.' If the case manager indicated that they would recommend relocation to a nursing home, they were asked how likely they would be to initiate commitment proceedings if the client chose not to relocate using the same five point scale. For all possible actions, case managers were asked how likely they would be to make a referral for a protective services investigation, also using the same five point scale. Finally, an open-ended question asked respondents to indicate any other actions they might pursue that were not covered in the closed-ended section.

3.3.6.3 Case Manager Background Survey

The case manager background survey used both open-ended and closed-ended questions to collect data on professional characteristics of the respondents (see Appendix B). The items for the background survey were drawn from the literature on case management, but the survey itself was developed by the investigator for this project.

A non-exclusive set of questions asked the respondent to indicate all secondary and post-secondary degrees or professional certifications. Exclusive (yes or no) questions were used to measure whether the respondent was a licensed social worker and his or her gender. Each case manager was also asked he or she had been working in case management (in years).

A battery of non-exclusive questions was used to determine what case management tasks respondents did on a regular basis. This was followed by an exclusive question about the best description of their job as case manager. The two-part method was used to measure the range of the respondent's experience as well as categorizing them based on what they mostly do. The same approach was used for questions about the type of clients the case manager

works with, and their source of training for resolving ethical dilemmas. For each of these questions, a space was provided for the respondent to indicate a category not provided on the survey.

A closed-ended question was used to measure the proportion of time the respondent usually spent providing direct, hands-on care as opposed to case management tasks. Hands-on care was defined as counseling, psychosocial counseling, or nursing services.

Case managers were asked to indicate the number of new assessments they conducted in the last full month (or to indicate if this did not apply to them because they never do new assessments). They were also asked to indicate the number of ongoing cases they currently had, or to indicate if this did not apply to them.

Finally, case managers were asked to indicate the source of funding for the majority of their clientele. Because agencies do not use Medicaid HCBS waiver funds exclusively, individual case managers within an agency may serve clients funded through different programs. This variable was used as exclusion criterion to identify case managers who were not part of the target sample.

3.3.6.5 Agency Survey

The agency survey form, included in Appendix B, was sent to agency directors to complete and return. Closed-ended questions were used to determine the average per client budget for services, the number of new clients entering in a typical month, the funding sources used to pay for client services, the type of community-based LTC services the agency arranges, the frequency of client - case manager contact, typical caseload sizes, the ratio of supervisors to staff, division of labor between intake and ongoing case managers, and whether client assessments or care plans need to be approved by supervisors.

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3.4 Variable Specification and Hypotheses

This section provides the logic used to recode the variables used in the analysis, as well as directional hypotheses for each independent variable. The independent variables are divided into three groups: client variables, case manager variables and agency variables.

3.4.1 Dependent Variable

The dependent variable was calculated from the fixed choice survey question that measured the action the respondent would take for each vignette (continue monitoring, recommend an in-home care plan, recommend relocation to a group home or recommend relocation to a nursing home). A dichotomous variable was used to indicate whether the respondent chose to continue monitoring or any other action. A trichotomous variable was used to indicate which action was selected.

3.4.2 Client Variables

Preference for Family Care. Clients were described as either preferring to have family members involved in their care or preferring not to have family members involved in their care. The first category was coded '1', and the second category was coded '0.'

It was hypothesized that case managers would be less likely to recommend any intervention, and less likely to recommend an out-of-home placement for clients who preferred to have family members involved. Independent of whether any family care is being provided, case managers will not recommend an intervention that would tend to supplant the clients' preferred mode of care.

Preference for Paid Home Care. Clients were described as either preferring to have paid providers involved in their care or preferring not to have paid providers involved in their care. The first category was coded '1', and the second category was coded '0.'

It was hypothesized that case managers would be more likely to recommend any intervention, and less likely to recommend an out-of-home placement for clients who preferred to have paid providers. Because case managers were hypothesized to be responsive to client

preferences, they should be less likely to intervene or recommend paid home care for clients who are not willing to have it.

Preference for Relocation. Clients were described as either completely against relocating to a nursing home, or open to the ideal of moving to a nursing home. The first category was coded '1', and the second category was coded '0.'

It was hypothesized that case managers would be less likely to recommend any intervention, and less likely to recommend an out-of-home placement for clients who preferred not to relocate to a nursing home. Case managers were hypothesized to be responsive to client preferences.

Physical Function. The clients' physical function was described as either low disability: limited in three IADLs (some difficulty with chores, laundry and preparing meals), or high disability: limited in both three IADLs and three ADLs (needs assistance with bathing, dressing and transfers). The low disability category was coded '0' and the high disability category was coded '1.'

It was hypothesized that high physical disability would lead to a higher likelihood of case managers recommending any intervention and a higher likelihood of recommending an out-of-home placement.

Cognitive Function. The clients' cognitive function was described as either articulate and oriented (no disability), or confused and disoriented (high disability). The low disability category was coded '0' and the high disability category was coded '1.'

It was hypothesized that high cognitive disability would lead to a higher likelihood of case managers recommending any intervention and a higher likelihood of recommending an out-of-home placement.

Health Need. The client's health was described as either creating a need for regular assistance (diabetes), or as a potentially unmanaged condition that could lead to crisis (congestive heart failure (CHF)). The diabetes category was coded as '0' and the CHF category

was coded '1.'

It was hypothesized that both categories would increase the likelihood of intervention, but the CHF category would be more likely to lead to an out-of home placement recommendation.

Age. The client's age was a random variable chosen from two ranges: younger (65 to 75) and older (85 to 95). Younger clients were coded with a '0' and older clients with a '1.'

The empirical research on age as a predictor of home care use is inconsistent. And research on age stereotypes in social work using vignette methods did not show any effect (). Hence it was hypothesized that, when included in a model with other predictors, age would not be a significant predictor of a recommendation to intervene or the type of intervention.

Informal Support. The level of informal support was described as either none, a daughter who visits weekly to help out, or a daughter who visits daily. Two dichotomous indicator variables were constructed, the first was coded '1' only if the level of informal support was weekly. The second was coded as '1' only if the level of support was daily.

It was hypothesized that availability and level of informal resources would lead to a lower likelihood of recommending an intervention and a lower likelihood of recommending an out-of-home placement. It was hypothesized that daily visits would have a stronger effect than weekly visits. The rationale for this hypothesis is that case managers will not generally supplant informal caregivers if they feel the amount of care is adequate to the clients needs (Kane, 1992).

Client Cash Resources. The level of client cash resources that could be used to purchase services was described as either none, \$50 a month or \$100 a month. Two dichotomous indicator variables were constructed, the first was coded '1' only if the client had \$50. The second was coded as '1' only if the client had \$100.

It was hypothesized that amount of client cash resources would lead to a lower likelihood of recommending an intervention and a lower likelihood of recommending an out-of-home placement. It was hypothesized that \$100 would have a stronger effect than \$50.

Agency Cash Resources. The level of agency cash resources that could be used to purchase services was described as either \$300 a month or \$500 a month. The first level was coded as '0' and the second level was coded as '1.'

It was hypothesized that amount of agency cash resources would lead to a lower likelihood of recommending an intervention and a lower likelihood of recommending an out-of-home placement. It was hypothesized that \$500 would have a stronger effect than \$300.

3.4.3 Case Manager Variables

Variables measuring case manager characteristics and used in analytic models were constructed from background questions included in the survey packet and are described below. Table 3.6 summarizes the hypothesized relationships between the independent and dependent variables. Empty cells indicate that no hypothesis is advanced.

Professional Education and Training. Two dichotomous indicators were used to capture either social work and or nursing education and credentials. Case managers were coded as social workers if they indicated that they had either a BSW, MSW. An additional indicator was used to capture whether the case manager was a licensed social worker. Case managers were coded as nurses if they indicated that they had a BSN, MSN, RN or LPN.

Case managers educated as nurses are hypothesized to be more protective of client safety; those trained as social workers are hypothesized to focus more on advocacy. No hypothesis is advanced for case managers who are not identified with either profession.

Educational Level. Two dichotomous indicators were used to capture either bachelors or masters level of education. Respondents who indicated that they were taking classes to complete a degree were coded as not having the degree.

It was hypothesized that a higher level of educational attainment would make case managers more responsive to client preferences.

Experience. Experience as a case manager was measured as a continuous variable in years.

Case managers' experience may influence decision making in contrasting ways. More experienced case managers are likely to be older, and may identify more closely with their clients and thus be more willing to respect preferences of clients who refuse services. But experience may also tap a generational difference, with younger case managers adopting a less paternalistic, and more client-centered approach. No hypothesis is advanced for this variable.

Gender. Gender was coded as a dummy variable, with '1' for males.

Although most case managers are female, gender is included to determine whether male case managers have different decision making patterns. No specific hypothesis was advanced for this variable.

Job Description. Case managers tasks were described with two dichotomous indicators. Those responsible for doing assessment, care planning, and service authorization were coded as doing 'intake only'. Those responsible for doing client monitoring, re-assessment were coded as doing 'ongoing only'. Case managers who do all tasks serve as the reference category.

It was hypothesized that case managers who continue with the same clients, those that do ongoing case management, will be more likely to respect a client's autonomous preferences than those who do intake only. Case managers who do all tasks will be similar to those who do ongoing case management. The rationale is that case managers who have more opportunity to get to know their clients will be more comfortable respecting preferences, especially in risky situations.

Client Population. The number of other populations beside the elderly that the case manager indicated working with (e.g., mentally retarded or developmentally disabled adults or children, people with AIDS or other populations). This was a continuous variable.

It was hypothesized that case managers who work only with the elderly, and less with other populations, will be less likely to recommend out-of-home placement for the elderly clients described in the vignettes, and more likely to respect client preferences.

Chapter 3: Methods

Direct Care. The proportion of time case managers spend doing direct, hands-on care, as opposed to case management tasks, was coded using an ordinal variable. Those that do no direct care were coded '0', those that do 10-20% were coded '1', those that do 20-30% were coded '2', those that do 30-40% were coded '3', and those that do 40% or more were coded '4'.

It was hypothesized that case managers who do direct clinical care will be more likely to intervene, but less likely to recommend an out-of-home placement. They will also be more responsive to client preferences.

Ethics Source. Case managers' source for resolving ethical dilemmas was coded using a dichotomous variable. Case managers who indicated that the most important source was something other than what they learned on the job were coded '1', and those who indicated the most important source came from on the job were coded '0.'

It was hypothesized that case managers who had some outside training in ethical decision making would place greater weight on client preferences than those who learned on the job.

Caseload. The number of cases, or caseload, was measured as a continuous variable.

Case managers with larger caseloads have less time available for individual clients and are less likely to learn about client preferences or work them into care plans. They may also be reluctant to support client preferences for less care because these clients will require more monitoring in the long run. It was hypothesized that higher caseload would predict a higher probability of recommending an out-of-home placement.

New Cases. The number of new assessments done in the past month was coded as a continuous variable.

Case managers who conduct more assessments are hypothesized to be less likely to intervene and more likely to recommend an out-of-home placement. They are also hypothesized to be less responsive to client preferences.

3.4.4 Agency Variables

Chapter 3: Methods

Variables measuring agency characteristics used in analytic models were constructed from the agency survey and are described below. Raw and recoded frequencies for each variable, including those not used in analytic models are presented in the results section.

Broker. Whether the agency can only arrange services by referral; i.e. no purchase authority.

Provide. Whether the agency provides any in-home services.

It was hypothesized that case managers who work in agencies with some provider capacity would be more likely to intervene, and less likely to recommend a out -of-home placement.

Average Monthly Budget. The average monthly budget available for client services was measured as dollars and converted to quartiles for analysis.

It was hypothesized that case managers who work in agencies with lower budgets for client services would be less likely to recommend an out-of-home placement. Case managers who work in agencies with low budgets should be more comfortable supporting clients at home with fewer resources.

Frequency of Client Monitoring. The frequency of client monitoring, which includes telephone contact, was measured as the minimum required per year.

It was expected that in agencies that required more frequent monitoring, case managers would have stronger relationships with their clients and be less likely to recommend an out-of-home placement.

Frequency of Home Visits. The frequency of home visits was measured as the minimum required per year.

It was expected that in agencies that required more frequent monitoring, case managers would have stronger relationships with their clients and be less likely to recommend an out-of-home placement.

Average Caseload. The average number of cases per case manager. This variable is

the agency level analog of individual caseload, and is hypothesized to measure group level or compositional effect.

It was expected that at agencies with higher average caseload, case managers would have less opportunity to develop relationships with their clients, and thus be more likely to recommend out-of-home placements.

Separate Staff for Intake and Assessment. This dichotomous indicator measures whether the agency has separate staff for intake tasks, or uses the same individuals for all case management tasks. (This is related to the individual level variable that measures what each person does).

Ratio of Supervisors to Case Managers. This was measured as the number of case managers per supervisor.

It was expected that agencies with a higher ratio of supervisors to case managers would have greater consistency across individuals in the same agency (e.g. lower within-agency variation).

Supervisors Must Approve Assessments. This was measured as a dichotomous indicator, where approval needed was coded as '1.'

It was expected that agencies where approval was needed would have greater consistency across individuals in the same agency. (Lower within-agency variation).

Supervisors Must Approve Care Plans. This was measured as a dichotomous indicator, where approval needed was coded as '1.'

It was expected that agencies where approval was needed would have greater consistency across individuals in the same agency (e.g. lower within-agency variation).

State. Dummy variables are included for each state to control for unobserved differences. It was hypothesized that in states where case managers are able to authorize services in alternative residential settings, they will be more likely to recommend a group home than a nursing home.

3.5 Analysis

The action that case managers indicated they would choose for each case was broken down to reflect the two stage decision model shown in Figure 3.1. The first stage decision, whether or not to intervene, was analyzed using hierarchical logistic regression. The second stage decision, the choice of home care, group home or nursing home was analyzed with hierarchical multinomial regression. All analyses were done with the MLn software package (Rasbash & Woodhouse, 1995).

Hierarchical models are fit in a series of steps. First, a conventional model, without hierarchical effects, is estimated. Then the hierarchical model with variance components about the intercepts in both case manager and agency levels. After modeling variance about the intercept, variance components for slope terms can be considered as well as independent variables measured at the case manager and agency level. This is a conservative strategy that avoids over-fitting the model (Bryk & Raudenbush, 1992).

3.5.1 Advantages of Hierarchical Models

Hierarchical models have several advantages over traditional methods for analysis of data from nested systems. First, hierarchical models allow the analyst to correctly specify models that include variables measured at different levels of aggregation. Consider a two-level problem of modeling patient outcomes across a sample of hospitals. If variables measured at both the patient and the hospital level are to be included, then it is important to identify the proper level of aggregation (or disaggregation) for each (Hox, Kreft, 1994). It is possible to make incorrect inferences about the effect of aggregate level effects on individual outcomes, committing the so-called "ecological fallacy." Finally, this strategy does not allow testing the hypothesis that hospitals may have different processes that account for different outcomes.

Second, traditional methods do not correct for the fact that data from individuals drawn from the same higher level unit will tend to be correlated. This is known as the intra-class correlation (ICC). Failure to take the ICC into account will lead to inflated standard errors for

regression parameters. A non-zero ICC can occur with cluster sampling of intact social units (Kish, 1963; Murray & Hannan, 1990) or in cross-sectional or panel data (Maddala, 1983). In a case management agency, the ICC may be the result of shared experiences within the organization or because of the process by which individuals initially enter particular organizations (Bryk & Raudenbush, 1992). Third, hierarchical models allow estimation of equations with heterogeneous regression parameters and partitioning of variation between hierarchical levels. Random effects or variance component models offer an alternative commonly used in economic applications. These models are less general, however, than hierarchical models and are typically limited to two levels of nesting (Raudenbush & Bryk, 1986). In addition to allowing estimation of heterogeneous regression parameters and variance components, hierarchical models can readily accommodate regression parameters that are functions of exogenous variables and an unlimited number of nested levels.

3.5.2 Equations

This section presents general equations for each hierarchical level and the combined equation for all levels. Specific forms for discrete outcomes are presented.

3.5.2.1 Client Level Equation

The first equation captures the process by which case managers translate client factors into a care plan. The intercept represents the mean decision for the reference case; the coefficients on the other variables (or slopes) represent the weights placed on each. Equation 1 allows for variation between case managers in the mean decision for the reference case (the intercept) and in the weight placed on clients' preferences for having family care (a_1), paid (a_2) and relocating to a nursing home (a_3). Equation 1 therefore specifies a separate intercept term, π_{0jk} , for each case manager and three separate slopes for each case manager (π_{1jk} , π_{2jk} , π_{3jk}). Throughout the following, l indexes vignettes (1 to 18), j indexes case managers (1 to n_j), k indexes agencies (1 to n_k).

$$(1) \quad y_{ijk} = \pi_{0jk} + \pi_{1jk}a_{1ijk} + \pi_{2jk}a_{2ijk} + \pi_{3jk}a_{3ijk} + \pi_{4jk}a_{4ijk} + \pi_{5jk}a_{5ijk} + \pi_{6jk}a_{6ijk} + \pi_{7jk}a_{7ijk} + \pi_{8jk}a_{8ijk} + \pi_{9jk}a_{9ijk} + \pi_{10jk}a_{10ijk} + \pi_{11jk}a_{11ijk} + \pi_{12jk}a_{12ijk} + e_{ijk}$$

Where:

- y_{ijk} = response for the i th vignette by the j th case manager in the k th agency;
- π_{0jk} = mean rating for the reference case (intercept);
- π_{pjk} = coefficient on the p th client variable ($p = 1$ to 12);
- a_{pijk} = indicator for the p th client variable (see Table 3.3);
- e_{ijk} = residual for the i th vignette rated by the j th case manager in the k th agency.

3.5.2.2 Case Manager Level

Specific components of individual in case managers' decision making processes are hypothesized to vary with characteristics of individual case managers. Equation 2 is known as a "slopes as outcomes" model, since the slopes in equation 1 are used as the outcome variables in equation 2. Since there are 4 coefficients in equation 1 (intercept and slopes on three preference variables) that are hypothesized to vary with characteristics of case managers, Equation 2 represents a set of 4 'stacked' equations.

Analogous to the Level-1 model, components of case managers' decision making are hypothesized to vary at the highest level of the hierarchy, i.e., the agency. Specifically, the mean effect (measured by the intercepts in Equation 2) of individual case managers' characteristics on the decision making parameters are functions of the agency in which he or she works. In each equation, therefore, the intercepts (β_{00k} , β_{10k} , β_{20k} , β_{30k}) are allowed to vary across agencies.

(2)

$$\begin{aligned}\pi_{0jk} &= \beta_{00k} + \sum_{v=1}^{13} \beta_{0v} x_{vjk} + r_{0jk} \\ \pi_{1jk} &= \beta_{10k} + \sum_{v=1}^{13} \beta_{1v} x_{vjk} + r_{1jk} \\ \pi_{2jk} &= \beta_{20k} + \sum_{v=1}^{13} \beta_{2v} x_{vjk} + r_{2jk} \\ \pi_{3jk} &= \beta_{30k} + \sum_{v=1}^{13} \beta_{3v} x_{vjk} + r_{3jk}\end{aligned}$$

Where:

$\pi_{0jk}, \pi_{1jk},$ π_{2jk}, π_{3jk}	=	intercept and slope terms from (1)
x_{qjk}	=	indicator for the qth case manager variable in the kth agency (q = 1 to 17)
β_{p0k}	=	intercept (mean case manager) in the kth agency in the pth equation (p = 0, 4, 5, 6)
β_{pq}	=	coefficient for the qth case manager variable in the pth equation (p = 0, 4, 5, 6)
$r_{0jk}, r_{1jk}, r_{2jk},$ r_{3jk}	=	residual for the jth case manager in the kth agency.

3.5.2.3 Agency Level Equation

The Level-3 equations can also be considered a 'slopes as outcomes' model. The four estimated intercepts from Equation 2 above ($\beta_{00k}, \beta_{10k}, \beta_{20k}, \beta_{30k}$) are used as the dependent variables in Equation 3.

$$\begin{aligned}
 \beta_{00k} &= Y_{000} + \sum_{v=1}^{14} Y_{00v} Z_{vk} + u_{00k} \\
 \beta_{10k} &= Y_{100} + \sum_{v=1}^{14} Y_{10v} Z_{vk} + u_{10k} \\
 \beta_{20k} &= Y_{200} + \sum_{v=1}^{14} Y_{20v} Z_{vk} + u_{20k} \\
 \beta_{30k} &= Y_{300} + \sum_{v=1}^{14} Y_{30v} Z_{vk} + u_{30k}
 \end{aligned}
 \tag{3}$$

Where:

$\beta_{0jk}, \beta_{1jk}, \beta_{2jk}, \beta_{3jk}$	=	intercept and slope terms from (2)
Y_{p00}	=	intercept for the effect of agency variables on pth equation ($p = 0, 4, 5, 6$)
Y_{p0s}	=	effect of the sth agency variable ($s = 1$ to 14) in the pth equation ($p = 0, 4, 5, 6$)
Z_{sk}	=	sth agency variable ($s = 1$ to 14) in the kth agency
u_{p0k}	=	residual for the kth agency in the pth equation ($p = 0, 1, 2, 3$).

3.5.2.4 Combined Equation for All Levels

Equations (1), (2), and (3) can be combined to form a single equation. For simplicity, matrix notation is used:

$$Y = \Pi A + E$$

The coefficient matrix and matrix of independent variables are partitioned to separate the coefficients that are hypothesized to vary across groups and the associated independent variables:

$$Y = \Pi A + \underline{\Pi} \underline{A} + E.$$

Where $\underline{\Pi}$ are the random coefficients, and \underline{A} are the associated independent variables.

$$\underline{\Pi} = \underline{B} + \underline{B}X + R$$

Where X is a matrix of level-2 independent variables, and \underline{B} is the vector of level-2 intercepts that vary across level-3 units.

$$\underline{B} = \Gamma Z + U$$

Where Z is a matrix of level-3 independent variables, and Γ are the associated coefficients.

Substituting,

$$Y = \Pi A + \underline{A}(\Gamma Z + U + BX + R) + E$$

$$Y = \Pi A + \Gamma Z \underline{A} + B X \underline{A} + (U \underline{A} + R \underline{A} + E).$$

In the general case of continuous dependent variables, E , U and R are assumed to be distributed multivariate-normal with mean of zero.

3.5.2.5 Variance Components

The notation for the variance components at the case manager and agency level are shown on Table 3.8. The residuals are assumed to be multivariate normal.

3.5.2.6 Expressions for Discrete and Multinomial Dependent Variables

Following Goldstein (1995, pp. 98-106), formulas for discrete and multinomial hierarchical models are presented for the simple case of a two-level model with one explanatory at the lowest level. In the case of a discrete dependent variable, we define p_{ij} as the probability that the observed response, y_{ij} , is equal to one, where

$$y_{ij} \sim \text{Bin}(p_{ij}, 1)$$

and

$$\text{var}(y_{ij}|p_{ij}) = p_{ij}(1 - p_{ij}) .$$

The expected probability is modeled using a logit transformation:

$$(4) \quad p_{ij} = \{1 + \exp(-[\beta_0 + \beta_1 x_{1ij} + u_{0j}])\}^{-1}$$

and estimated is based on:

$$y_{ij} = p_{ij} + e_{ij}z_{ij}$$

where:

$$z_{ij} = \sqrt{\frac{p_{ij}(1-p_{ij})}{n_{ij}}},$$

and $\sigma_e^2 = 1$. It is possible to allow the variance of e to be estimated, and compared to one. This allows a test for 'extra binomial' variation. Extra binomial variation can arise if the model is mis-specified, e.g. a three-level model is specified as a two level model or that a relevant explanatory variables have been omitted. Sparse data (e.g. few level-1 observations per level-2 unit) can also give rise to extra-binomial variation (Wright, in press). The variance of e is considered the 'dispersion parameter', and if it is lower than one then the data are considered over-dispersed. It is not clear whether overdispersion affects the estimates of the fixed effects or the applicability of the logit transformation. A finding of overdispersion will therefore be taken as a rough indication of potential sparse-ness or mis-specification.

The contents of the square brackets in equation 4 are made up of two parts: fixed and random. The fixed part, here written as $\beta_0 + \beta_1 x_{1ij}$, and the random part, u_{0j} , can be replaced with the expressions derived above (equations 1,2 and 3) for a larger, more complicated model. The distribution of the random parameters is assumed to be normal.

For the case of a multinomial dependent variable, an expression is written for the proportion of responses in each of t categories and one category is chosen as the reference category:

$$p_{ij}^{(s)} = \frac{\exp(\beta_0 + \beta_1 x_{1ij}^{(s)} + u_{0j}^{(s)})}{1 + \sum_{h=1}^{t-1} \exp(\beta_0 + \beta_1 x_{1ij}^{(h)} + u_{0j}^{(h)})}$$

where $s = 1, \dots, t-1$.

An equation for each value of s can be written. The data for each equation are 'stacked' and multiplied through by a set of $t-1$ dummy variables. Estimation proceeds as usual. Note that in a multinomial model there are variance components for each $t-1$ choice at each level in the hierarchy.

3.5.3 Estimation of Hierarchical Models

There are several estimation algorithms and software packages commercially available specifically designed for hierarchical models. Each has its advantages and disadvantages. The traditional method of analyzing hierarchical models is known as the "slopes as outcomes" approach, and can be done using conventional software. In this approach, separate OLS regression models are calculated for each higher level unit and the estimated parameters (i.e.; slopes) are used as the dependent variables in a new regression. While this logic has been used to explicate the model, as an estimation approach it violates one of the basic assumptions of OLS: that the regression parameters are assumed to be fixed across the data set (Kennedy, 1992). This problem can arise with time series data or when estimating cross-industry economic models where true value of the parameter differs over time or due to technology. The result is that while estimates of the parameters are unbiased, the standard errors are not correct (Kennedy, 1992; Hox & Kreft, 1994). Hierarchical models allow the analyst to specify models that estimate different coefficients in different time periods or cross-sections.

Three general approaches have been taken to the estimation of hierarchical models: the IGLS method of Goldstein (1995) implemented in MLn, and the empirical bayes method using the EM algorithm of Bryk and Raudenbush (1992) implemented in HLM. Full bayesian approaches have been explored using Gibbs Sampling, but are computationally intensive with large data sets (Draper, 1995; de Leeuw & Kreft, 1995; Goldstein 1995; Bryk & Raudenbush, 1992). Draper (1995) summarizes the state of the field of estimation as "a Babel of options",

with no clear guidance as to the best alternative.

Goldstein (1995) points out that under conditions of multivariate normality of the random effects, the IGLS and empirical bayes estimates using the EM algorithm are equivalent. The IGLS, and the restricted IGLS (RIGLS) algorithm that takes into account uncertainty in the parameter estimates, is neither an empirical bayes or true bayesian approach. The MLn software thus does not provide the 'shrinkage estimates' as does HLM.

MLn has a technical advantage over HLM in the ability to fit models with multinomial dependent variables. Estimation of these models is done with generalized least squares based on a first or second order Taylor series approximation of the exponential in the expression for p , shown above (Goldstein, 1995). Because the linearization assumes the variances of the random parameters to be known, an iterative process is used that first estimates these variances from the data. The estimates of the variances are then updated after estimating the fixed parameters. This is referred to as a 'marginal quasi-likelihood' (MQL) function. Rodriguez and Goldman (1995) have shown that under certain conditions, MQL estimates of fixed and random effects are biased downward. An alternative estimation that produces better results is known as 'penalized' or 'predictive' quasi-likelihood (PQL). This algorithm includes an estimate of the residual from each the previous iteration as a further offset to the Taylor series. A slight bias, on the order of 4%, in the estimates of the standard errors remains (Goldstein & Rasbash, 1995). The most recent version of HLM 4.0 uses PQL with a first order Taylor series approximation (Bryk, Raudenbush & Congdon, 1996), but can not handle multinomial models or models with more than two hierarchical levels.

3.5.4 Assessing Adequacy of Hierarchical Models

In the case of equations with continuous dependent variables, the $-2 \times (\log \text{likelihood})$ can be compared for successive models to test the hypothesis that each provides a better fit to the data. In the case of discrete or multinomial data, however, the likelihood values are approximate and hence cannot be used to test hypotheses about successive models (Goldstein, 1995, p.

103). As an alternative, Goldstein (1995) recommends testing the hypothesis that each variance component is non-zero using a chi-square test. If it is concluded that there are hierarchical effects, then the analysis can proceed by including explanatory variables measured at the case manager or agency level.

An additional criterion for assessing the utility of binary and multinomial models is the ability of the model to correctly classify observations. The predictive power of models that successively add variables from higher levels in the hierarchy will be calculated and compared using the proportional reduction of error method. While there are no statistical tests available for comparing measures of proportional reduction in error, this information will be used heuristically to assess each model.

For comparison purposes, logit and multinomial logit models will be run using traditional software (e.g., Stata). These estimates will provide a baseline against which to compare the predictive power of the hierarchical models, as well as traditional likelihood ratio tests for successive models. Estimates that do not, however, take into account the nested nature of the data will in general be inefficient, and hypothesis tests will not be correct.

An additional criterion for an adequate model is that the distributional assumptions are met. This is typically done by examining the estimated residuals, however, in traditional logit and multinomial logit models there are no estimated residuals. The 'residual' is just the predicted probability for a given set of exogenous variables. This is true for the lowest level of a hierarchical model as well. At higher levels in the hierarchy there is a residual associated with the estimate of each random intercept or slope. The distribution of these random terms is assumed to be normal (or multivariate normal).

The MLn software provides two methods for calculating residuals. The first method provides diagnostic residuals which are used to check the distributional assumptions. These diagnostic residuals are calculated under the assumption that all other parameters in the model are fixed, ignoring uncertainty in other parameters. Normit plots of these residuals will be

generated. The second method provides 'comparative' residuals. The comparative residuals take into account the complex structure of the model (i.e., that there are more than one residual). These will be used for generating prediction tables.

Finally, in assessing hierarchical models with discrete dependent variables it is not possible to calculate measures of the variance explained (R^2). In models with continuous dependent variables, Bryk and Raudenbush (1992) and Snijders and Bosker (1994) recommend calculating the proportion of variance explained for the overall model and for between-group variances (ie. intercept and slope terms that vary between groups). The proper formula for calculating the explained variance of a between-group parameter depends in part on the within group variance (Snijders and Bosker, 1994), which is just the variance of level-1 residual. Omitting the within group variance from the calculation of the explained variance (e.g. using just the change in the variance of the level-2 parameter) can lead to a situation where the addition of explanatory variables actually *decreases* the explained variance. In a logit model the addition of explanatory variables changes the intercept and hence the position on the log-odds scale where the variance is evaluated. Successive models cannot be compared based on the variance because the baseline will not be relevant. Furthermore, since there is no level-1 residual in a logit model, there is no practical way to calculate a variance explained measure for logit models (Snijders, personal communication). For these reasons variance explained measures will not be presented.

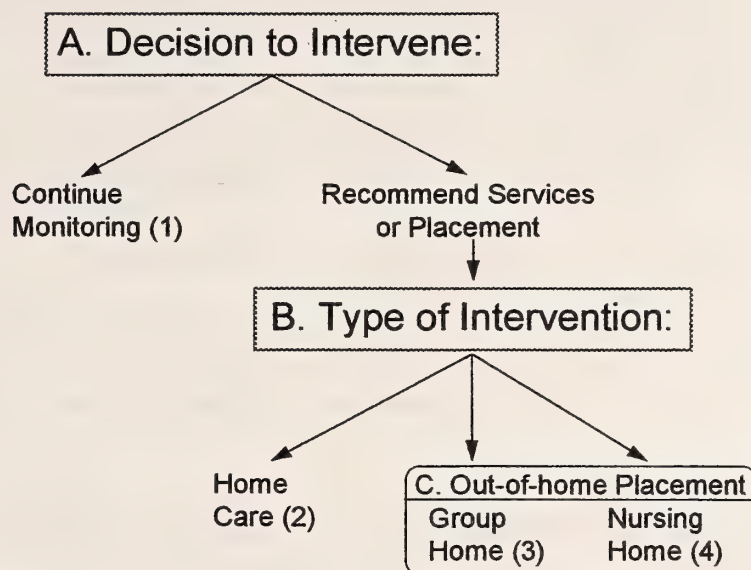


Figure 3.1. Case Manager Decision Making Model

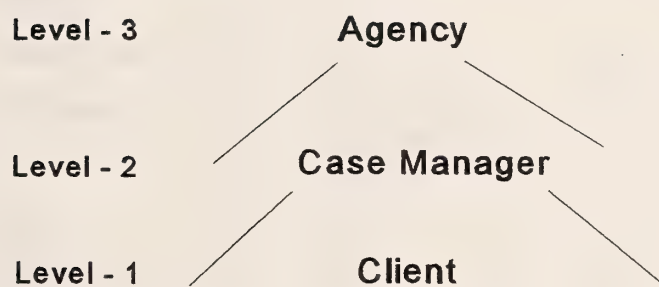


Figure 3.2 Hierarchical Nesting of Client, Case Manager and Agency

Table 3.1. Number of State Programs with Selected Characteristics

	Low Intensity (<2 visits/ year) (n = 12)		High Intensity (>2 visits/ year) (n = 17)	
	Not Provide	Provide	Not Provide	Provide
Individual CM	5 AK IL MO RI WA	1 CO	3 AL KY SC	5 FL IN ME NJ NM
SW and Nurse Team	3 CT MA NH	3 MN OR WI	4 AZ CA NY OH	4 GA KS NC VA
Total	8	4	8 ^a	9

^a Information on use of teams was not available for WV.

Table 3.2 Criteria For Selecting Local Case Management Agencies

State	Total	Criteria	Selected	Not Eligible	Responded (%)
California	22	All	22		21 (96)
Colorado	24	Have 5 or more CMs	12		11 (92)
Connecticut	5	All	5		5 (100)
Florida	60	All	60		42 (70)
Georgia	28	All	28		23 (82)
Indiana	18	All	18	2	15 (94)
Massachusetts	27	All	27		23 (85)
Minnesota	87	10 MSA and 10 non-MSA Counties	25 ¹		18 (72)
Ohio	13	All	13		12 (92)
Washington	19	All	19	1	14 (78)
Wisconsin	44	10 MSA and 10 non-MSA Counties	24 ¹ / 34 ²	2	28 (88)
Total	347		253 / 263	5	212 (81)

¹ Due to sampling variation, the number of counties selected is greater than the quota.

² Dane and Milwaukee counties were served by multiple local agencies; these became the sampling units for the next stage.

Table 3.3 Vignette Variables, Text and Coding

Variable/Level:	Text:	Code:
Preference for Family Care:		
Not Willing	She prefers not to have any family members involved in her care.	0
Willing	She wants to have family involved in her care as much as possible.	1
Preference for Paid Home Care:		
Not Willing	She does not like having strangers in her home to take care of her.	0
Willing	She does not mind the idea of having paid helpers around her home to take care of her.	1
Preference for Relocation to a Nursing Home:		
Not Willing	The client never wants to move to a nursing home.	0
Willing	The client is not completely against moving to a nursing home.	1
Physical Function: ^a		
IADL Only	The client is always very neatly dressed, and takes pride in her appearance. She does not have any problems with mobility, and likes to go for walks when the weather is nice. Recently, due to her health, she is having some difficulty with doing chores, laundry and preparing meals.	0
3 ADLs	Due to her health, the client has some difficulty doing chores, laundry and preparing meals. She also has trouble washing and bathing herself without assistance, and needs a lot of help with transfers and getting dressed.	1
Cognitive Function:		
Alert	She is articulate and keeps up with current events.	0
Confused	She is disoriented and confused most of the time.	1
Health:		
Diabetes	The client has diabetes that needs careful control, including having her insulin syringes set up weekly to avoid serious medical complications.	0
CHF	The client has been hospitalized several times in the past year for congestive heart failure that makes breathing difficult at times and causes her feet to swell substantially each day.	1
Age:		
65 to 75		0
85 to 95		1
Informal Support:		
None	The client does not have any friends or family available to help with her care.	0
Weekly	The client has a daughter who visits weekly to help out.	1
Daily	The client has a daughter who visits every day to help out.	2

Table 3.3 Vignette Variables, Text and Coding

Variable/Level:	Text:	Code:
Table 3.3 (continued) Vignette Variables, Text and Coding		
Client Cash Resources:		
\$0	She is living on social security and has no savings.	0
\$50	She gets social security, has a small pension, and has some money saved up, but not a lot. She could contribute \$50 a month to help pay for her services.	1
\$100	The client lives fairly comfortably, and has some savings that might be used to help pay for care. She could contribute \$100 a month to help pay for her services.	2
Agency Cash Resources:		
\$300	Your agency can spend up to \$300 to purchase services for this client, in addition to what she herself can contribute.	0
\$500	Your agency can spend up to \$500 to purchase services for this client, in addition to what she herself can contribute.	1

^a See Table 3.4 for alternative wordings for Physical Function

Table 3.4 Alternative Wordings for Physical Function

Alternative wordings for "IADL Only" level:

1. The client does not have any problems with mobility, and likes to go for walks when the weather is nice. She is always very neatly dressed, and takes pride in her appearance. However, she now needs some help doing chores, laundry and preparing meals.
2. The client does not have any problems with bathing, dressing, or mobility. In fact, she likes to go for walks when the weather is nice. Recently, due to her health, the client has some difficulty with doing chores, laundry and preparing meals.

Alternative wordings for "3 ADLs" level:

1. The client's physical condition is such that she has some difficulty with chores, laundry and preparing meals. She also has trouble washing and bathing herself without assistance, and needs a lot of help with transfers and getting dressed.
2. The client needs some help with doing chores, laundry and preparing meals. She also has trouble washing and bathing herself without assistance, and needs a lot of help with transfers and getting dressed.

Table 3.5 Vignette Example (Base Case)

The client is a 73 year old woman who lives alone. She is living on social security and has no savings. The client does not have any friends or family available to help with her care.

- The client is always very neatly dressed, and takes pride in her appearance. She does not have any problems with mobility, and likes to go for walks when the weather is nice. Recently, due to her health, she is having some difficulty with doing chores, laundry and preparing meals. She also has occasional 'accidents' where she wets the bed at night.
- The client has diabetes that needs careful control, including having her insulin syringes set up weekly to avoid serious medical complications. She is articulate and keeps up with current events.
- She prefers not to have any family members involved with her care. She does not like having strangers in her home to take care of her. The client never wants to move to a nursing home.

Your agency can spend up to \$300 to purchase services for this client, in addition to what she herself can contribute.

Table 3.6 Summary of Hypotheses for Case Manager Variables

Independent Variable	Dependent Variable					
	Intervene	Nested Model		Unordered Model		Weight of Client Preferences
		Out-of-Home	Group Home v. Nursing Home	Group Home v. Home Care	Nursing Home v. Home Care	
Social Worker ^a	-	-	-	-	-	+
Nurse ^a	+	+	+	+	+	-
Licensed Social Worker	-	-	-	-	-	+
Educational Level		-	-	-	-	+
Gender ^b						
Intake ^c	+	+	+	+	+	-
Ongoing ^c	ns	ns	ns	ns	ns	ns
Direct Care	+	+	+	+	+	+
Ethics Source		-	-	-	-	+
Other Client Populations		+	+	+	+	-
New Cases in Full Month	-	+	+	+	+	-
Caseload	-	+	+	+	+	-
Years Worked		-				

^a Reference category is: no professional education or training. ^b Reference category is: female. ^c Reference category is: does all case management tasks.

Table 3.7 Summary of Hypotheses for Agency Variables

Independent Variables	Dependent Variable					
	Intervene	Nested Model		Unordered Model		
		Out-of-Home	Group Home v. Nursing Home	Group Home v. Home Care	Nursing Home	Home Care
Broker Only						
Provide Services	+			+	-	
Average Budget per Client		+		+	+	
Separate staff for intake and assessment						
Supervisors must approve assessments		*		+	+	
Supervisors must approve care plans		*		+	+	
Frequency of Client Monitoring		-		-	-	
Frequency of Home Visits		-		-	-	
Ratio of Supervisors to Staff		*		*	*	
Average Caseload		+		+	+	
State						
Size (Corrected for ineligibles)						

* Inversely related to within-agency variation

Table 3.8 Variance Components

Residual	Variance Component	Interpretation
r_{0jk}	σ_{0jk}	Overall within-CM variance (intercept)
r_{1jk}	σ_{1jk}	Within-CM variance related to client preferences for family care
r_{2jk}	σ_{2jk}	Within-CM variance related to client preferences for paid
r_{3jk}	σ_{3jk}	Within-CM variance related to client preferences for relocation
u_{00k}	σ_{00k}	Overall within-Agency variance (intercept)
u_{10k}	σ_{100k}	Within-Agency variance related to client preferences for family care
u_{20k}	σ_{20k}	Within-Agency variance related to client preferences for paid
u_{30k}	σ_{30k}	Within-Agency variance related to client preferences for relocation

CHAPTER 4: RESULTS

4.1 Introduction

This chapter is divided into two main sections: (1) descriptive statistics and (2) results of model fitting and testing. The first section describes the agencies and case managers in the study, the steps taken to impute missing values, presents relevant bivariate contrasts, and describes the distribution of the dependent variables. The second section presents logit and multinomial logit model estimates and hypothesis tests.

Before presenting the findings, an important point must be made about interpreting the coefficients in hierarchical models and especially models with discrete dependent variables. It is generally not possible to directly interpret or assign meaning to the estimated regression coefficients. In particular, the effects of case manager characteristics on the slopes of client level variables do not have a simple interpretation. Indeed, it is somewhat misleading to describe them in this way (as is done below). For example, the estimated coefficient of the effect of 'social worker education' on the slope of 'client preference for family care' is actually the predicted probability of the outcome variable for the 'zeroth' case manager in the 'zeroth' agency with social work education, and all other variables held at zero (i.e. the reference category). The coefficients must therefore be combined with the appropriate intercepts and independent variables to calculate the predicted probability of the outcome of interest. This analysis is provided in Chapter 5 along with tables that summarize the statistically significant results. The tables in Chapter 5 were used to provide guidance in looking for the effects of case manager and agency variables. Then the beta coefficients were looked up from tables in this chapter and to calculate predictive probabilities.

4.2 Descriptive Statistics

4.2.1 Sample Size

A total of 211 agencies and 2135 case managers were surveyed (see Table 4.1). Table 4.1 also shows the average response rate by state (number returned over number sent, corrected for number ineligible), indicating differential response rate across states.

Of the 211 agencies surveyed, 199 had one or more case manager return the survey. Based on data from the agency and case manager surveys the following exclusion criteria were applied:

- A. Agencies that do not use Medicaid Waiver dollars were excluded;
- B. Case Managers that did not provide sufficient background information were excluded; and
- C. Case Managers were excluded who:
 - 1. Did not work mainly with the elderly;
 - 2. Were adult protective service workers only;
 - 3. Were supervisors only; or
 - 4. Were primarily or exclusively nursing home pre-admission screeners.

Of the 199 agencies with participating case managers, 12 were not funded through Medicaid HCBS Waivers (see Appendix C, Table 15) and were dropped. This excluded 73 case managers.

Five case managers out of 1001 did not provide sufficient background information to be used (See Appendix C, Table 1). Of the 923 remaining case managers, 59 did not work mainly with the elderly, 12 described their jobs as adult protective service workers, 34 were supervisors, and 10 were nursing home pre-admission screeners. These four exclusion categories could overlap, hence only 93 individuals were excluded, leaving a final sample size of 830 case managers in 187 agencies.

4.2.2 Agency Variables

Table 4.2 summarizes the agency variables used in all analyses and describes the 187 agencies on key parameters. The following sections describe how each variable was computed from raw survey data and how missing values were imputed.

Purchase Authority. An agency's purchase authority is the amount of control it has over resources used to pay for client services. Two dichotomous variables were created: 'broker only' and 'provide any.' Agencies that function on a strict brokerage model (9.1%) do not have any authority over the financial resources used for client services. This variable was coded as 'yes' if the agency director indicated on the survey that they brokered or referred, and did not purchase or provide all of the following: homemaker/chore, personal care, nursing, transportation, meals, day care, or any other service. (The number of agencies that purchase, broker or each service can be found in Appendix C, Table 16).

Agencies that provide some or all of the services they also case manage (52.9%) have an economic interest in the delivery of those services. This variable was coded 'yes' if the agency director indicated that they provide any of the above list of services.

Per Client Budget. The amount of money for direct services typically spent per client per month was coded into quartiles. There were 30 cases missing data on this item. To compute replacement values, the average per client per month budget was calculated for all agencies in each state and agencies with missing data were assigned to the quartile of the state.

Bivariate comparisons were done to assure that these data were not missing because the agency used a strict brokerage model and hence per client budgets are not applicable (i.e. they do not use budgets). Of the 17 brokerage only agencies, 13 (77%) provided per client budget information. This suggests that although these agencies do not directly authorize payment for services they are aware of the budget requirements set by the state program.

Division of Labor. At the agency level, slightly more than half (52.4%) used separate staff for intake and assessment tasks.

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Bivariate analyses were done between the number of case managers and the use of separate staff. Agencies that did not use separate staff had an average of seven (7) case managers, while agencies that did use separate staff had an average of 12 case managers ($t=5.8$; $p < .000$).

Approve Assessments. Supervisory approval of all assessments was required in 39% of agencies.

Approve Care plans. Supervisory approval of care plans was required in 42% of agencies.

Frequency of Client Contact. The minimum required frequency of client contact was measured in terms of general monitoring and in-home visits. A continuous variable was coded to reflect the number of visits per year. The average frequency of client monitoring was about 7 times a year, the average number of home visits was 4 per year.

Ratio of Supervisors to Staff. The number of case managers per supervisor was coded as a continuous variable. For six agencies this number was missing. The size of these agencies was relatively small; the average size was seven case managers. It is likely that they did not have more than one supervisor in such small agencies, if they had one at all. Hence the number of case managers was used as a proxy for the number of case managers per supervisor. Agencies that indicated they used a team approach were coded with the average number of case managers on each team. The mean based on the 'complete' data set was not different from the original data.

Average caseload. The average caseload for case managers at each agency ranged from 5 to 250. Seven agencies did not provide this information. However, the individual case managers in those agencies did indicate their own caseload on the case manager survey. These average of these values per agency was computed and used as the agency level variable. The mean based on the 'complete' data set was not different from the original data.

Number of Case Managers. The number of case managers in each agency identified by

the agency director. If there were any individuals surveyed who turned out not to do case management, they were subtracted from the total.

4.2.3 Case Manager Variables

Table 4.3 summarizes the case manager variables for the sample of 830 case managers. The following sections describe each variable and present the steps taken to handle missing data.

Gender. The majority of case managers were female (85.7%). There were three (3) case managers who did not indicate their gender on the survey; these were recoded using their first names from the mailing list.

Educational Level. Two indicator variables were computed to indicated the highest post-secondary degree completed. Dummy variable coding was used, with 'no college degree' as the reference category. Two-thirds of the sample (67%) had a bachelors and one fifth (19%) had a masters degree. Case managers that did not indicate having completed any post-secondary degrees were placed in the reference category.

Professional Education, Training and Licensure. Variables that measure professional education, training and licensure were computed from the degrees and certification case managers indicated that they held. Case managers with a nursing degree (either at the bachelors or masters level), an RN or an LPN were coded as nurse.

Case managers with a social work degree (either bachelors or masters) were coded as a social worker. Case managers who did not indicate that they held any post-secondary degrees were coded 'no' for both types of professional training. The indicators were coded non-exclusively, however there was very little overlap between social work and nursing; only 7 case managers had both qualifications.

A single dichotomous question was used to measure whether the case manager was a licensed social worker. Of 232 case managers with social work education, 127 (55%) were also licensed. Of the 598 case managers without social work education, 120 (20%) were licensed

social workers. And of the 173 (21%) case managers with nursing credentials, 9 (5%) were licensed social workers. There were seven (7) case managers with both nursing and social work credentials (.8% of the total); three (3) of whom were licensed social workers.

Job Description. Case managers were placed into one of three categories based on a survey question that asked what best describes their work as a case manager (see Appendix C, Table 5). Dummy variable coding was used. The majority of case managers (81%) did all case management tasks themselves; this was the reference category. Ninety-nine (99) case managers (11.9%) specialized in ongoing case management tasks, and 59 case managers (7.1%) specialized in intake tasks.

Direct Care. The amount of time spent giving hands on direct care was collected as a series of ranges, from 'no direct care' to over 40%. Missing data from 54 cases were placed in the modal category which was 'no direct care'.

Source of Training for Ethical Decision Making. Case managers' most important source for resolving ethical dilemmas was coded dichotomously: either on the job (63.7%) or another source (36.3). Other sources were: religious values (78; 9.4%), their professional society (26; 3.1%), a course or seminar (23; 2.8%), or books and articles (7; .8%). About 10% (83) case managers indicated two or more categories; these were coded as 'other source'.

Other Population. The extent to which case managers indicated that they work with client populations other than the disabled elderly was captured by counting the number of other populations they work with. Other populations included: adult protective service clients, non-elderly disabled people, mentally retarded or developmentally disabled adults or children, people with AIDS, and other. There were 22 cases for which information on the populations they work with was not available; these cases were placed in the modal category.

New Cases. The number of new cases in the last full month was coded as a continuous variable. Missing data (10 cases) were replaced with the mean (6.2).

Case managers who described their jobs as doing ongoing tasks only had an average of

1.8 new cases (s.d. 4.4; range 0 to 30). Those who indicated they did all tasks had an average of 6 new cases (s.d. 6.8; range 0 to 60). And those who specialize in intake had an average of 16.5 new cases (s.d. 11; range 0 to 43). The mean for each group was significantly different than each other group at the $p < .000$ level based on the Scheffe and Bonferroni tests for multiple comparisons.

Caseload. Case managers' caseload size was coded as a continuous variable. Missing data (27 cases) were replaced with the mean (63.6).

Years Worked. The number of years worked as a case manager was coded as a continuous variable. Missing data (10 cases) were replaced with the mean (6.2).

Note on Replacement of Missing Values. The replacements done to eliminate missing data were compared with replacement based on the covariance matrix of the data. This was done by using the 'impute' function in Stata for continuous data and logistic regression for discrete data. All explanatory variables, except the variable in question, were used to impute values for the missing cases. This procedure produced the same result as using the mean for continuous data and the mode for discrete data. This implies that the data were missing at random, rather than in a systematic way. (Most missing data occurred on questions printed on the second and third pages of the background section which occasionally stuck together.)

4.2.4 Dependent Variable

The dependent variables were derived from a survey question that measured case managers' intended care plan recommendation for each vignette. The first two columns of Table 4.4 show the raw distribution of this question. Four indicators were computed to capture whether (1) the case manager recommended any intervention at all versus continued monitoring; (2) whether the recommendation was for an in-home or out-of home placement; (3) whether an out-of-home placement was for group home or a nursing home; and (4) the type of intervention recommended. The second and third variables are used in the fully nested model, and the fourth pertains to the non-nested model.

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the tenth is the fact that the
the eleventh is the fact that the
the twelfth is the fact that the

the thirteenth is the fact that the
the fourteenth is the fact that the
the fifteenth is the fact that the

the sixteenth is the fact that the
the seventeenth is the fact that the
the eighteenth is the fact that the

There were 1086 observations excluded from analysis: 894 were blank, 192 checked more than one option. No imputation was done to replace missing values of the dependent variable.

Analysis of the pattern of missing or unusable vignettes was done for the sample of 830 case managers. The average number of cases completed per case manager was 16.8 and the median was 18. Inspection of the frequency distribution reveals that 91% of respondents completed 15 or more vignettes, and 98% completed 10 or more. In general, case managers who returned the survey completed nearly all of the vignettes.

4.3 Results of Model Fitting and Testing

There are two dependent variables presented in separate sections: the decision to intervene and the type of intervention. For each dependent variable, an initial model with only client variables was first estimated. These initial results were used to test the hypothesis that individual case managers and agencies had idiosyncratic intercepts and slopes (e.g. different baseline probabilities of making each decision and different weights on client preferences in each decision). What is estimated empirically is the mean of this distribution and the deviation from the mean for each case manager and each agency. The deviation, or residual, for each case manager or agency can be added to the overall mean to estimate the value for that specific unit. If the variance of this distribution is zero (or not statistically different than zero) for some parameter then it may be concluded that all individuals have the same value for that parameter. Only those intercepts and slopes that varied across case managers or agencies were retained in the final model with all explanatory variables.

Once the individual specific intercepts and slopes have been estimated, it remains to explain them based on variables that measure case manager and agency characteristics. By adding case manager and agency variables to the model, each intercept term is treated as an outcome variable. The new estimates of the individual specific intercepts now capture unexplained differences between individuals. These residuals are retained and used to generate

predictions.

In order to explain differences in individual specific slope terms, a vector of interaction terms is added to the model. For example, if each case manager places a different weight on client preferences for paid home care, then each case manager variable is interacted with the indicator for that client preference and added to the model. Individual specific estimates of the slope on client preferences for paid home care are thus treated as outcome variables, and the interaction terms are interpreted as being regressed on them.

In order to assess the impact of each set of explanatory variables and interaction, each set was added on a separate model step. The predictive power of the model and the -2 Log Likelihood were calculated for each step for comparison. A prediction table is shown for the final model only.

Finally, when possible, the least biased estimation algorithm was used. That is, PQL is preferred to MQL, and 2nd order estimates are preferred to 1st order estimates. However, the least biased method is also the least stable and most sensitive to the specification of the model and the distribution of the data. The method used is noted on all results, and the potential effects on the results are discussed under limitations in the discussion chapter.

4.3.1 Decision to Intervene

The variable that measures the decision to intervene was first regressed on the client variables only to estimate the hypothesized variance components. Random effects were included at both the case manager and agency level for the intercept and the effect of client preferences regarding having family help, having paid home care and relocation to a nursing home.

Preliminary inspection of the data revealed that 475 (57%) of the 830 case managers in the sample had answered all of their vignettes the same way (ie with some intervention recommended). This distribution, referred to as under-dispersion, made it impossible to estimate the effects of case manager characteristics. The sample of 6079 vignettes from the 355 case managers whose responses varied were used for all subsequent analysis (see Appendix E for diagnosis of under-dispersion).

Table 4.5 shows the estimates of the variances in the intercept and slopes for the restricted sample. In this and all subsequent tables of variances and covariances, the variances of each parameter are on the diagonal and the covariances between each pair of parameters are on the off-diagonal. The variance in agency level intercept was .08325 and is not statistically significant. The variance in the case manager level intercept was .9528.

At the case manager level, there was evidence that individuals have idiosyncratic intercepts ($\sigma_{0jk} = .9528$) and that they place different weights on client preferences for paid home care ($\sigma_{2jk}=2.245$). The variance in the slopes on preference for family care was not estimated because it was not significant in a preliminary run (see Appendix E). The variance in the slope on preference for relocation to a nursing home was not statistically different than zero, indicating that case managers placed the same weight on this preference.

The estimates of the case manager specific intercepts ranged from -2.3 to 1.4. The estimates of the slope on client preference for paid home care ranged from -2.9 to 2.6, and the estimates of the slope on client preference for relocation ranged from -1.1 to 1.4. (For graphs of

these distributions, see Appendix E, Figure 3.)

There was significant covariation between the intercepts and slopes. As the intercept increases the slopes on preference for paid home care and preference for relocation to a nursing home decrease ($\text{cov } \sigma_{0jk}, \sigma_{2jk} = -1.1$; and $\text{cov } \sigma_{0jk}, \sigma_{3jk} = -.5$). This means that case managers with a high base rate of intervening place low weight on client preferences in this decision. Also, the case manager specific slopes on preference for paid home care and Preference for relocation to a nursing home covary ($\text{cov } \sigma_{2jk}, \sigma_{3jk} = .9$), which means that case managers who place a high weight on preference for paid home care also place a high weight on Preference for relocation to a nursing home.

Although the variance in the slope on preference for relocation to a nursing home was not statistically significant in the complete sample, it did covary with the intercept and with Preference for paid home care. For reasons of parsimony its variance was estimated.⁶ Note that it is not significant in the restricted sample as well (.2756). This finding implies that while the model that allows each case manager to have a separate slope on Preference for relocation to a nursing home fits the data (based on the significant covariances), these estimates are strongly collinear with the estimates on Preference for paid home care and modestly collinear with the intercept.

Table 4.6 presents the effect of client characteristics on the decision to intervene or continue monitoring. These results are based on the hierarchical model with case manager and agency predictors also included, therefore all parameters must be interpreted as the effect for the reference case manager in the reference agency. The strongest predictor was client willingness to have formal providers take care of her (OR 13.3), followed by limitation in three

⁶Because the slope on preference for relocation to a nursing home covaries with the intercept and the slope on preference for paid home care, conceptually it must have some (non-zero) variance. It is therefore not parsimonious to restrict the estimate of its variance to zero. To test this empirically, the model was estimated restricting the variance of the slope on Preference for relocation to a nursing home to zero. The -2LL of this model was higher and the predictive power was lower; suggesting that although not-significant, the variance of the slope on preference for relocation to a nursing home should be estimated.

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activities of daily living (OR 3.66) and confusion (OR 3.1). Note that of the three coefficients that were allowed to vary across individuals (i.e. the intercept, preference for paid home care and preference for relocation), only one remains statistically significant (i.e. preference for paid home care; $T = 4.51$; $p < .01$).

Table 4.7 shows the effect of case manager characteristics on their individual intercepts. The strongest predictor was whether the case manager specialized in intake tasks. These case managers were nearly twice as likely (OR 1.95) to recommend an intervention in the reference case than case managers who do all tasks or who specialize in ongoing case management tasks. Case managers with a bachelors degree were more likely to recommend an intervention in the reference case than those with no college degree or a masters (OR 1.6). Case managers who spent more of their time providing direct care were somewhat more likely to recommend an intervention (OR 1.15), and case managers who had more years of experience were slightly less likely to recommend an intervention (OR .97), however the confidence interval for this variable included one.

Tables 4.8 and 4.9 show the effects of case manager characteristics on the slope on client preferences for paid home care and relocation, respectively. In general, the case manager variables measured did not predict their individual slopes on client preferences for this decision. The only statistically significant finding was that for each year of experience, case managers had about 5% higher value on the slope on client preferences for having paid home care (OR 1.05).

Table 4.10 shows the effects of agency characteristics on the intercept. The strongest predictor at the agency level was whether the agency also provided some in-home services (OR 1.5). Agencies that generally required more frequent home visits to clients had a small positive effect on the intercept (OR 1.05); the odds of an intervention increased by 5% for each additional visit per year. Agencies that used separate case managers for intake and ongoing tasks had a significantly lower intercept (OR .72) than those that did not. Finally, the only cross-state difference was between Georgia (OR .46) and the reference category (California). Case

managers from Georgia were only half as likely to recommend an intervention as case managers from other states (OR .46).

In order to interpret the overall contribution of each set of independent variables, Table 4.11 shows the change in the -2 Log Likelihood and predictive power after adding each set, and Table 4.12 shows the prediction table for the final model. Note that the log-likelihood values are only approximate, and must be interpreted with caution. The -2 Log Likelihood (-2LL) of the base model with just client variables is -1960.2. Also, compared to simply guessing the modal category (85% of cases had some intervention recommended), the base model correctly classifies 88.3% of cases. This is a 2.9% improvement and a 22.1% reduction in the error rate. Adding case manager and agency variables to the model resulted in statistically significant reductions in the -2LL based on the likelihood ratio test⁷ and a .1% increase in the predictive power of the model. The addition of case manager variables intended to explain variation in the slope on Preference for paid home care also produce a significant change in the -2LL and a .1% improvement in predictive power. However, adding case manager variables to explain variation in the slope on Preference for relocation to a nursing home does not produce a change in the -2LL and actually reduces the predictive power of the model. This finding is consistent with the fact that none of these variables had significant coefficients in the regression model (see Table 4.11). An explanation is that while the slope on Preference for relocation to a nursing home covaried with the intercept (-.5221) and the slope on Preference for paid home care (.9231), the estimate of its variance was not much larger than its standard error (.2756; s.e. .2131). Hence there was no residual variation in the slope on Preference for relocation to a nursing home to explain.

Finally, the finding that each set of variables changed predictive power by only .1% is most likely due to the highly unbalanced marginal. Since 85% of the cases can be correctly

⁷The likelihood ratio test compares the difference in the -2LL to the chi-square distribution with degrees of freedom equal to the difference in the number of predictors in each model.

classified with a simple model that merely predicts the modal category, there is not much room for improvement.

4.3.2 Type of Intervention Recommended

Case manager respondents could recommend three possible interventions for each client: home care, group home placement or nursing home placement. These data were analyzed using hierarchical multinomial logit. In a multinomial logit one category of the dependent variable is designated the reference category, and the remaining categories are considered 'alternatives'. There is one set of estimated regression coefficients, sometimes referred to as an 'equation', for each alternative. In the present study, home care was used as the reference category. The coefficients therefore represent the change in the log odds of a group home or nursing home recommendation for a unit change in an explanatory variable. Each set of coefficients includes an intercept term that measures the odds of recommending a group home or nursing home placement if all explanatory variables are zero.

The variable that measured the type of intervention recommended by the case manager respondent (i.e. home care, group home or nursing home) was first regressed on client variables only to estimate the variance in the intercept terms and in the slopes on client preferences (i.e. Preference for family care, Preference for paid home care, Preference for relocation to a nursing home). In the initial model the intercepts were allowed to vary across agencies and case managers. To avoid over-fitting the model, and based on the general finding from the logit model that there is substantially less variation at the agency level than the case manager level, the slopes terms were allowed to vary between case managers.

Table 4.13 shows the estimates of the variances and covariance of the intercept terms for the agency level of the model. There is nearly three times as much variation in the nursing home intercept (.27) as in the group home intercept (.1).

Table 4.14 shows the variances and covariances for the case manager level. There is nine times as much variation in the group home intercept at the case manager level (.92) than at the agency level (.1). In the nursing home intercept there is more than 6 times as much variation at the case manager level (1.7) than at the agency level (.27). As in the logit model, there is substantially more variation in the nursing home intercept (1.9) than in the group home intercept (.99).

There is evidence that case managers have idiosyncratic values for the intercept in each equation and all slope terms except the preference for family care (Preference for family care) in the nursing home equation. The pattern of covariances between slopes and intercepts is similar between the two equations. In general, as the intercept increases (i.e. the probability of recommending a group home or nursing home for the reference case), the weight case managers place on client preferences tends to decrease. The one exception is that the slope on preference for paid home care in the group home equation tends to increase as the intercept increases (cov = .2348).

The ranges of the agency- and case manager-specific estimates of the intercept and slope terms are shown on Table 4.15.

Table 4.16 presents the effect of client characteristics on the decision to recommend a group home or nursing home versus home care. All variables except health were statistically significant predictors of a recommendation for both group home and nursing home placement. All variables were consistently positive or negative in each equation, and while the magnitude varied somewhat, the overall pattern was generally the same. The strongest positive predictor of group home placement was cognitive function (OR 4.2), followed by being willing to consider relocation (OR 1.8) and physical disability (OR 1.6). For nursing home, the strongest predictor was physical disability (OR 7.6), followed by cognitive function (OR 7.4) and being willing to consider relocation to a nursing home (OR 3). The strongest negative predictor of both group home placement and nursing home placement was being willing to have formal home care

providers (OR .3; .3), followed by having a daughter who visits daily (OR .5, .4).

In general, client preferences affected case managers' recommendations in the expected direction. Clients who were willing to have family or paid providers help out were less likely to have a group home (OR .6; .3) or a nursing home (OR .7; .3) recommendation. As noted above, clients who were willing to consider relocation to a nursing home were more likely to have a recommendation for a group home placement (OR 1.8), and a nursing home placement (OR 3). While the effect of client preferences for the type of in-home care was consistent across choices, the effect of client willingness to consider a nursing home had a weaker effect on the odds of a group home recommendation than on the odds of a nursing home recommendation by a factor of 1.6. This is most likely because client preferences expressed in the vignette did not specifically mention relocation to a group home. Case managers thus had to extrapolate and apply the information they had to decide whether a group home, sometimes seen as a less restrictive placement than a nursing home, would be optimal. This is consistent with the finding that there was more variation in the case manager-specific estimates of the slope on Preference for relocation to a nursing home in the group home equation (.57) than the nursing home equation (.35).

Table 4.17 shows the effect of case manager variables on the level of the intercept in each equation. None of the variables were statistically significant predictors of the group home intercept, however several did predict the nursing home intercept. Specifically, whether the case manager specialized in intake tasks only (compared to ongoing tasks or all tasks) was associated with higher odds of recommending a nursing home (OR 2.7). Note that it is only possible for case managers to specialize in intake tasks if they work in an agency that has separation of tasks. Figure 4.1 thus presents the coefficients for the independent effects of being an intake or ongoing case manager, the agency effect, and the combined effects of being an intake or ongoing worker *in an agency with separation of tasks*. The top three rows show the independent effects of being an intake worker, an ongoing worker and the effect of working in an agency with

separation of tasks. There is a strong negative effect of working in an agency with separation of tasks (OR .72; see Table 4.21).

The bottom two rows show the combined individual and agency effects. Case managers who do intake only are more likely to recommend both a group home (combined OR 1.5) and a nursing home (combined OR 1.9).⁸ Case managers who do ongoing tasks are slightly less likely to recommend a nursing home (combined OR .8), however this is due to the overall effect of working in an agency with separation of tasks. In general, case managers who specialize in ongoing tasks are not different than case managers who do all tasks or who work in agencies without separation of tasks.

Professional training as a nurse (OR 1.5) or social worker (OR 1.6) was associated with higher odds of recommending a nursing home. Having ethics training other than on the job was associated with lower odds of recommending a nursing home (OR .77).

The effects of case manager characteristics on the size of the slope on client preferences for family care in the group home equation are shown on Table 4.18. Case managers who do more direct care had slightly higher values for the slope on preference for family care (OR 1.05), as did those with more new cases (OR 1.01). Case managers who specialize in intake (OR .7) or ongoing tasks (OR .8) had lower values for the slope on preferences for family care.

Table 4.19 shows the effects of case manager characteristics on the slope of client preferences for paid home care. Case managers with professional training as nurses had slightly higher values for the slope on client preferences for paid home care in the group home decision (OR 1.3), however, the confidence interval included one. In general, neither type of professional training or education had an effect. The effect of education, either a bachelors (OR 1.4) or a masters (1.5), was to increase the slope on client preferences in the nursing home decision.

Case managers with more new cases had slightly higher slopes on preferences for paid

⁸Significance tests were not calculated for the combined effects.

home care (OR 1.01; an increase of 1% per new case per month), however the 95% confidence interval for this result included one, making it only marginally significant.

Finally, case managers who specializes in intake tasks had lower slopes on preferences for paid home care in both group home (OR .5) and nursing home equations (OR .5).

The effect of case manager variables on the slope of client preferences for relocation is shown on Table 4.20. The only statistically significant predictor was whether the case manager had training as a nurse, which lead to lower slope on client preferences for relocation to a nursing home in the group home equation (OR .79), however the confidence interval for the odds ratio included one.

The effects of agency variables on the odds of recommending a group home or nursing home, all other things being equal, are shown on Table 4.21. Agencies that function on a strict brokerage model have the effect of making group home recommendation less likely (OR .7). Requiring a greater frequency of home visits increases the odds of a group home placement (OR 1.03; an increase of 3% per visit per month). Greater frequency of monitoring leads to slightly higher odds of a nursing home recommendation (OR 1.03; increase of 3% per visit per month). Agencies that provide some services directly have increased odds of nursing home recommendation (OR 1.5). As noted above, having separate case management staff for intake and ongoing tasks leads to lower odds of nursing home recommendation (OR .72). Requiring supervisors to approve assessments increases the odds of a nursing home placement (OR 1.4), however having supervisors approve care plans decreases the odds (OR .6). Finally, there were a number of significant state dummy variables.

To assess the importance of the explanatory variables, Table 4.22 shows the change in the -2LL and predictive power after adding each set, and Table 4.23 shows the prediction table for the final model. Each set of explanatory variables is accompanied by a statistically significant reduction in the -2LL. Overall, the final provides a 29% improvement in predictive power compared to a model which merely guessed the modal category (62% of cases would be

classified correctly by predicting home care for every case). However, the predictive power of the model does not increase with the addition of each set of explanatory variables. The only major improvement comes with the addition of the state dummy variables (from 23% to 29%). This trend does not necessarily imply that adding more variables deteriorates the model, since individually, many variables were significant predictors. The addition of each set of independent variables to the model changes the intercept and thus the point on the probability scale where the predicted values are calculated. Random noise may cause this to be somewhat closer or farther away from perfect predictive power than a previous step.

4.3.3 In-Home Services v. Out-of-Home Placement.

For the 13029 vignettes where the case manager indicated some type of intervention as opposed to continuing to monitor the case, the recommendations were coded to reflect whether the case manager believed the client should have in-home services (62%) or an out-of-home placement (38%) (see Table 4.4). This variable was regressed on client factors only to estimate the hypothesized variance components. Random effects were included at both the case manager and agency levels for the intercept and the effect of client preferences for having family help, paid home care, and relocation.

This preliminary analysis (Table 4.24) revealed that there were no significant variance components at the agency level in either the intercept or slopes. All variances were either zero or non-significant. At the case manager level there is evidence of between-individual variation in the intercept (3.448) and in the slopes on client preferences for paid home care (1.739), family care (.6208) and relocation (1.381). There were also significant covariances between the slopes and the intercept. In general, as the intercept increases, the slope on each client preference variable decreases (-.2286; -.769; -.6811). Finally, the slope on client preference for paid home care covaried negatively with the slope on preference for relocation (-.5294).

Table 4.25 shows the minimum, maximum and median of the individual specific estimates of the agency level slope and case manager level intercept and slopes.

Finally, the dispersion parameter was estimated to be .6988. This would appear to indicate underdispersion. The distribution of the data were inspected to determine if this arose due to case managers with no variation within their individual samples. Only 7.6% of the 13029 vignettes available for this analysis came from case managers who gave the same response to all vignettes. (Of these 993 vignettes, 96.9% were coded in-home services.) This is a small percentage of the sample, and not enough to cause concern.

Table 4.26 shows the effects of client variables on case managers' decision to recommend an out-of-home placement instead of in-home services. Greater physical disability (OR 4.9), age (OR 1.3), and cognitive disability (OR 11) all increase the odds that an out-of-home placement will be made. Clients with higher levels of resources, including cash contributions of \$50 (OR .89) or \$100 (OR .77) and weekly (OR .54) or daily (.33) visits from a daughter are less likely to have an out-of-home placement.

Clients who are willing to have paid providers help with their care are much less likely to have an out-of-home placement (OR .17), as are clients who are willing to have family help out (OR .48). Clients who are willing to relocate are much more likely to have an out-of-home placement (OR 3.9) than those who would not consider it at all.

Case manager variables were included in the model to determine if they were associated with differences in each individuals' intercept and slopes. These results are shown on tables 4.27, 4.28, 4.29 and 4.30. In general, few of the measured variables had any effect. Case managers who specialize in intake were twice as likely to recommend an out-of-home placement (OR 2.14).

Male case managers had lower values on the slope on client preference for family care (OR .73). Case managers with more new cases in the previous month had higher values on the slope on preferences for family care (OR .02). And intake case managers had lower values for the slope on client preferences for paid home care (OR .42) than case managers who did all case management tasks.

The effects of agency variables on the overall likelihood of recommending an out-of-home placement are shown on Table 4.31. Case managers from agencies that provide some services were more likely to recommend an out-of-home placement (OR 1.44). Case managers from Connecticut and Minnesota were more likely to recommend an out-of-home placement (OR 5.31; 2.3), compared to those from California. The other states did not differ significantly from California or each other.

To interpret the overall contribution of each set of independent variables Table 4.32 shows the change in the predictive power of the model. Table 4.33 shows the prediction table for the final model with all variables. The initial model with client variables only offers a 40% improvement over simply guessing the modal category (In-Home Care; 62%). Each successive step, however, does not appear to improve the model. Indeed, the addition of state dummy variables seems to be detrimental in terms of predictive power. This finding is not surprising, given that most variables had no effect.

4.3.4 Group Home v. Nursing Home Placement

For the 4984 vignettes where the case managers indicated that they would recommend an out-of-home placement, the type of placement was coded as either a group home (56%) or a nursing home (44%) (see Table 4.4). This variable was regressed on client factors only to estimate the hypothesized variance components. Random effects were included at both the case manager and agency levels for the intercept and the effect of client preferences for having family help, paid home care, and relocation.

Table 4.34 shows the results of this preliminary regression. At the agency level, there was variation in the intercept (1.21), however not in any of the slope terms. At the case manager level, there was variation in the intercept (4.463) and in the slopes on client preferences for family care (1.463), paid home care (1.664), and relocation (2.34). There was covariation between the intercept and the slope on preference for relocation (-1.433). Case managers with a high value for the intercept tended to have high values for the slope on preferences for

relocation. Table 4.35 shows the ranges and medians of the intercept and slopes.

Finally, the dispersion parameter was estimated to be .4139. This would appear to indicate underdispersion. The distribution of the data were inspected to determine if this arose due to case managers with no variation within their individual samples. About 27% of the 4984 vignettes available for this analysis came from case managers who gave the same response to all vignettes. (Of these 1325 vignettes, 69% were coded group home.) This is a modest percentage of the sample, indicating that forcing the model to assume binomial variation would not be appropriate.

Table 4.36 shows the effects of client variables on the decision to recommend a group home or nursing home placement. Greater physical disability (OR 19.2), age (OR 1.41), and cognitive disability (OR 4.8) all increase the odds that an out-of home placement will be made. Cash resources, both agency budget and client contribution did not affect this decision. However, weekly (OR .68) or daily (OR .6) visits from a daughter reduced the likelihood of a nursing home placement compared to a group home placement.

Clients who are willing to relocate to a nursing home were much more likely to have a recommendation for a nursing home than a group home (OR 4.62). Note that while client preferences for paid home care or family care were not statistically significant, there were significant variance components associated with these coefficients. This implies that for the average case manager in the average agency, there is no effect of these variables (the slope is not different than zero). However, for some case managers in certain agencies, the slope on client preferences for paid home care or family care may be different than zero. Table 4.37 shows the effect of case manager variables on the intercept. No variables were statistically significant predictors of the average decision for the reference case.

Tables 4.38, 4.39, and 4.40 show the effect of case manager variables on the slopes on client preferences for family care, paid home care and relocation. Only two statistically significant findings emerge. Case managers who are licensed social workers have a higher

value for the slope on client preferences for family care (OR 1.7). And, case managers who work with other populations besides the elderly have slightly a lower value for the slope on client preferences for relocation (OR .83).

Table 4.41 shows the effects of agency variables on the average recommendation for the reference case. There are a number of statistically significant findings. Case managers who work in agencies that function on a brokerage model only are more likely to recommend a nursing home than a group home (OR 2.54). And case managers who work in agencies that require supervisors to approve all care plans are less likely to recommend a nursing home than a group home (OR .43).

Finally, there were a number of differences among states. Case managers from Connecticut (OR 11.99) , Indiana (OR 5.92), Massachusetts (OR 4.28) and Ohio (5.1) were more likely to recommend a nursing home than a group home compared to case managers from California. Case managers from Washington were substantially less likely to recommend a nursing home than a group home (OR .11).

To help interpret the importance of each set of independent variables, Table 4.42 shows the change in overall predictive power after adding each set, and Table 4.43 shows the full prediction table for the final model. With the addition of case manager and agency variables to the base model with client variables only increases the predictive power of the model. However, the addition of state dummy variables diminishes the predictive power as does the addition of interactions between case manager variables and preferences for paid home care and preferences for family care. The addition of interactions between case manager variables and preferences for relocation improves the overall predictive power.

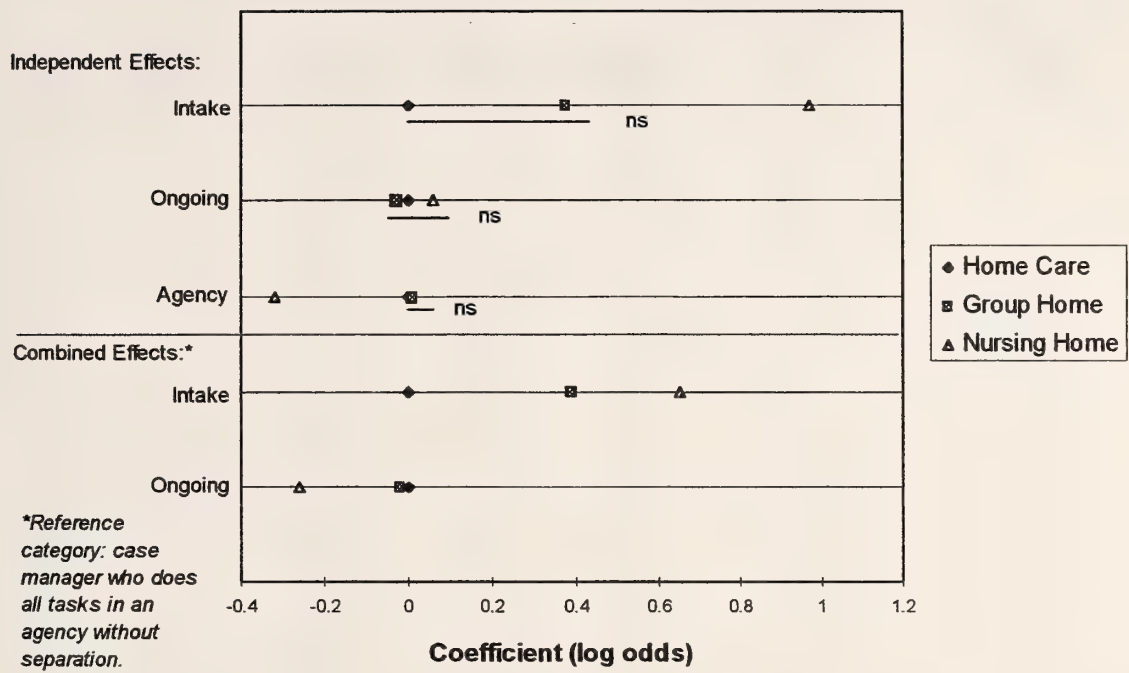


Figure 4.1 Effect of Intake and Ongoing Specialization on Intercept

Table 4.1 Agency and Case Manager Response Rate by State

State	Agencies Surveyed	CMs Surveyed	CMs Responded	Ineligible CMs	Average CM Response Rate	Agencies With > 0 CMs Responding
CA	21	189	59	12	42.9	19
CO	11	115	41	12	43.4	11
CT	5	69	46	9	76.4	5
FL	41	262	120	13	56.9	33
GA	23	121	49	18	61.6	21
IN	15	180	112	17	66.4	15
MA	23	376	149	22	40.9	23
MN	18	134	86	10	72.5	18
OH	13	245	121	16	53.3	13
WA	13	215	103	8	54.6	13
WI	28	229	115	11	57.4	28
Total	211	2135	1001	145	55.8	199

Table 4.2 Description of Agencies in the Study

Variable	Value	Code	n	%
Broker Only	Yes	1	170	90.9
	No	0	17	9.1
Provide Services	Yes	1	99	52.9
	No	0	88	47.1
Average Monthly Budget per Client	< 187	1	41	21.9
	187 to 359	2	39	20.9
	350 to 650	3	57	30.5
	> 650	4	50	26.7
Separate staff for intake and assessment	Yes	1	98	52.4
	No	0	89	47.6
Supervisors must approve assessments	Yes	1	73	39
	No	0	114	61
Supervisors must approve care plans	Yes	1	79	42.2
	No	0	108	57.8
		Range	Mean	SD
Frequency of Client Monitoring		0 to 12	7.2	4.7
Frequency of Home Visits		0 to 12	4	3
Ratio of Supervisors to Staff		1 to 28	7.7	3.4
Average Caseload		5 to 250	68	29.9
Number of Case Managers		1 to 37	9.7	6.5

n = 187

Table 4.3 Description of Case Managers in the Study

Variable	Level	Code	n	%
Gender	Male	1	119	14.3
	Female	0	711	85.7
Educational Level	No College Degree	0	114	13.7
	Bachelor	1	556	67
	Masters	1	160	19.3
Social Work Education	Yes	1	232	28
	No	0	598	72
Licensed Social Worker	Yes	1	237	28.6
	No	0	583	70.2
Nurse Education	Yes	1	173	79.2
	No	0	657	20.8
Job Description	Does all CM task	0	672	81
	Intake Only	1	59	7.1
	Ongoing Only	1	99	11.9
Direct Care	No Direct Care	0	308	37.1
	10% to 20%	1	189	22.8
	20% to 30%	2	118	14.2
	30% to 40%	3	93	11.2
	40% or More	4	122	14.7
Source of Training in Ethical Decision Making	Mostly On the Job	0	529	63.7
	Other Sources	1	301	36.3
		Range	Mean	S. D.
Other Populations		0 to 6	2.3	1.5
New Cases in Full Month		0 to 60	6.2	7.6
Caseload		0 to 335	63.6	42.3
Years Worked		0 to 37.5	6.9	6.2

N = 830

Table 4.4 Case Managers' Recommended Care Plan Action

Raw Data	Total		Intervene		Home v. Out-of- Home		Group Home v. Nursing Home		Type of Inter- vention	
	n	%	Code	%	Code	%	Code	%	Code	%
Continue Monitoring	915	7	0	7	-	-	-	-	-	-
Develop an in- home care plan	8045	58	1	93	0	62	-	-	0	62
Relocate to a group home	2769	20	1		1	38	0	56	1	21
Relocate to a nursing home	2215	16	1		1		1	44	2	17
Total	13844		13844		13029		4948		13029	

Table 4.5 Variances and Covariances of Random Coefficients from Restricted Sample (s.e.; Chi-Square)

Level		Variance - Covariance		
		Intercept	Slope on Preference for	
			Paid home care	Relocation to a NH
Agency	Intercept	.08325 (.0586) 2.02		
Case Manager	Intercept	.9528 (.1813) 27.63 **		
	Slope on Preference for:			
	Paid home care	-1.128 (.234) 23.24 **	2.245 (.4563) 24.21 **	
	Relocation to a NH	-.5221 (.1653) 9.97 **	.9231 (.2286) 16.3 **	.2756 (.2131) 1.67

Note: Estimates from 1st Order PQL procedure.

** p<.01

Table 4.6 Effect of Client Variables on Case Managers' Decision to Intervene

PARAMETER	B	S. E.	T-Ratio	Odds	95% Conf. Int.	
					Lower	Upper
Intercept	0.12	0.56	0.22	1.13	0.38	3.39
Physical Function (3 ADLs)	1.30	0.09	14.03 **	3.67	3.06	4.40
Age (> 85)	0.37	0.09	4.21 **	1.44	1.22	1.71
Cognitive Function (Confusion)	1.12	0.09	12.31 **	3.07	2.57	3.68
Health (CHF)	-0.29	0.09	-3.35 **	0.75	0.63	0.89
Preferences: (Willing)						
Have Family Help	-0.17	0.09	-1.94 *	0.84	0.71	1.00
Have Formal Providers	2.59	0.57	4.51 **	13.29	4.31	40.95
Relocate to a Nursing Home	0.35	0.38	0.92	1.41	0.68	2.96
Informal Support:						
Daughter Visits Weekly	-0.26	0.12	-2.22 **	0.77	0.61	0.97
Daughter Visits Daily	-1.28	0.11	-11.70 **	0.28	0.22	0.34
Agency Budget (\$500)	0.06	0.09	0.72	1.07	0.90	1.26
Client Contribution:						
\$50	0.09	0.11	0.80	1.09	0.88	1.34
\$100	0.00	0.10	0.04	1.00	0.82	1.23

Reference categories are: IADL Only, Age < 85, Not Confused, Diabetes, Not Willing, No Informal Support, Agency Budget \$300, and \$0 Client Contribution.

* p < .05; ** p < .01

Table 4.7 Effect of Case Manager Variables on Mean Decision for Reference Case

PARAMETER	B	S. E.	T-Ratio	Odds	95% Conf. Int.	
					Lower	Upper
Professional Qualifications:						
Social Work Education	0.17	0.21	0.81	1.19	0.78	1.81
Social Work License	-0.22	0.21	-1.04	0.80	0.53	1.21
Nurse Education	0.33	0.27	1.20	1.39	0.81	2.38
Educational Level:						
Bachelors	0.44	0.27	1.66 *	1.56	0.92	2.63
Masters	0.22	0.33	0.66	1.24	0.65	2.38
Gender (Male)	0.00	0.27	0.01	1.00	0.59	1.70
Task Specialization:						
Intake Only	0.67	0.35	1.89 *	1.95	0.98	3.89
Ongoing Only	0.04	0.28	0.14	1.04	0.60	1.81
Number of Other Client Populations	-0.05	0.06	-0.78	0.95	0.85	1.07
Amount of Direct Care	0.14	0.06	2.42 **	1.15	1.03	1.29
Ethics Other Than On The Job	-0.01	0.18	-0.03	0.99	0.70	1.42
Years Worked	-0.03	0.01	-2.02 **	0.97	0.94	1.00
New Cases in Last Month	-0.01	0.01	-0.98	0.99	0.97	1.01
Caseload	0.00	0.00	-0.38	1.00	0.99	1.00

Reference categories: no professional qualifications, no higher education, no task specialization

* p < .05; ** p < .01

Table 4.8 Effect of Case Manager Factors on Importance of Client Preference for Paid Home Care

PARAMETER	B	S. E.	T-Ratio	Odds	95% Conf. Int.	
					Lower	Upper
Professional Qualifications:						
Social Work Education	-0.35	0.33	-1.04	0.71	0.37	1.36
Social Work License	-0.12	0.31	-0.37	0.89	0.48	1.64
Nurse Education	0.34	0.45	0.75	1.41	0.58	3.42
Educational Level:						
Bachelors	-0.16	0.43	-0.38	0.85	0.37	1.98
Masters	-0.12	0.53	-0.23	0.88	0.31	2.50
Gender (Male)	-0.48	0.42	-1.15	0.62	0.27	1.40
Task Specialization:						
Intake Only	-0.40	0.57	-0.70	0.67	0.22	2.06
Ongoing Only	-0.14	0.43	-0.33	0.87	0.37	2.02
Number of Other Client Populations	0.06	0.09	0.61	1.06	0.88	1.27
Amount of Direct Care	-0.10	0.10	-1.09	0.90	0.75	1.09
Ethics Other Than On The Job	-0.39	0.29	-1.34	0.68	0.38	1.20
Years Worked	0.04	0.02	1.92 *	1.04	1.00	1.09
New Cases in Last Month	0.00	0.02	0.16	1.00	0.97	1.04
Caseload	0.00	0.00	-0.81	1.00	0.99	1.00

Reference categories: no professional qualifications, no higher education,

* p < .05; ** p < .01

Table 4.9 Effect of Case Manager Factors on Importance of Client Preference for Relocation

PARAMETER	B	S. E.	T-Ratio	Odds	95% Conf. Int.	
					Lower	Upper
Professional Qualifications:						
Social Work Education	-0.08	0.24	-0.35	0.92	0.58	1.46
Social Work License	-0.13	0.21	-0.60	0.88	0.58	1.34
Nurse Education	-0.14	0.29	-0.48	0.87	0.49	1.54
Educational Level:						
Bachelors	-0.05	0.28	-0.18	0.95	0.54	1.66
Masters	0.23	0.36	0.65	1.26	0.63	2.53
Gender (Male)	-0.03	0.29	-0.10	0.97	0.55	1.72
Task Specialization:						
Intake Only	-0.47	0.39	-1.21	0.62	0.29	1.34
Ongoing Only	-0.35	0.31	-1.15	0.70	0.38	1.28
Number of Other Client Populations	0.08	0.06	1.18	1.08	0.95	1.22
Amount of Direct Care	-0.03	0.06	-0.49	0.97	0.85	1.10
Ethics Other Than On The Job	0.08	0.20	0.38	1.08	0.73	1.59
Years Worked	0.02	0.02	1.39	1.02	0.99	1.05
New Cases in Last Month	0.02	0.01	1.62	1.02	1.00	1.05
Caseload	0.00	0.00	-0.14	1.00	0.99	1.01

Reference categories: no professional qualifications, no higher education,

* p < .05; ** p < .01

Table 4.10 Effect of Agency Factors on Mean Decision for Reference Case (Intercept)

PARAMETER	B	S. E.	T-Ratio	Odds	95% Conf. Int.	
					Lower	Upper
Brokerage Model Only	0.06	0.25	0.26	1.07	0.65	1.74
Provide Some Services	0.42	0.17	2.48 **	1.52	1.09	2.11
Budget (Quartiles)	0.03	0.08	0.43	1.03	0.89	1.20
Separate Intake and Ongoing Supervisory Approval:	-0.33	0.13	-2.47 **	0.72	0.55	0.93
Assessments	-0.16	0.20	-0.81	0.85	0.58	1.25
Careplans	-0.17	0.21	-0.79	0.85	0.56	1.28
Frequency of Client Monitoring	0.02	0.02	1.31	1.02	0.99	1.05
Frequency of Home Visits	0.04	0.02	1.94 *	1.05	1.00	1.09
Ratio of Staff to Supervisors	-0.02	0.02	-1.20	0.98	0.95	1.01
Average Caseload	0.00	0.00	1.64	1.00	1.00	1.01
Number of Case Managers	-0.01	0.01	-0.61	0.99	0.97	1.01
State:						
Colorado	-0.44	0.41	-1.07	0.64	0.29	1.44
Connecticut	0.54	0.44	1.22	1.72	0.72	4.11
Florida	-0.40	0.33	-1.21	0.67	0.35	1.28
Georgia	-0.78	0.40	-1.96 **	0.46	0.21	1.00
Indiana	-0.07	0.38	-0.19	0.93	0.45	1.94
Massachusetts	-0.10	0.34	-0.30	0.90	0.47	1.74
Minnesota	0.02	0.36	0.04	1.02	0.50	2.07
Ohio	-0.07	0.37	-0.18	0.94	0.45	1.95
Washington	-0.06	0.39	-0.16	0.94	0.44	2.03
Wisconsin	0.16	0.38	0.42	1.18	0.56	2.48

Reference categories: not strictly brokerage, does not provide any services,
no separation of tasks, no supervisory approval, state of California.

* $p < .05$; ** $p < .01$

Table 4.11 Summary Statistics for Each Set of Predictors in Hierarchical Logit

Model Step:	-2 Log Likelihood	% Correctly Classified	% Improvement in Prediction ^a	% Reduction in Error
Client	-1960.2	88.3	2.9	22.1
Case Manager	-2138.05 **	88.4	4.0	22.6
Agency	-2222.36 **	88.5	4.1	23.3
State	-2291.77 **	88.6	4.3	24.3
Case Manager Variables Interacted With Client Preferences For:				
Paid home care	-2386.44 **	88.7	4.3	24.5
Relocation to a NH	-2386.54	88.6	4.2	23.9

Note: Estimates from 1st Order PQL procedure.

^a Compared to % correct based on choosing the modal category: 85%.

** Chi-Square of likelihood ratio test significant at $p < 0.05$.

Table 4.12 Prediction Table for Decision to Intervene

		Predicted		Total	Marginal
		Monitor	Intervene		
Actual	Monitor	318	597	915	.15
	Intervene	97	5067	5164	.85
Total:		415	5664	6079	
Marginal:		.68	.93		

Table 4.13 Variances and Covariances of Random Intercepts at the Agency Level from Initial Multinomial Logit Model

	Variance - Covariance	
	Group Home	Nursing Home
Group Home	.1023 (.03676) 7.75 **	
Nursing Home	-.1139 (.0391) 8.49 **	.2725 (.07243) 14.16 **

Note: Estimates are from 1st Order MQL procedure.

Table 4.14 Variances and Covariances of Random Coefficients at Case Manager Level from Initial Multinomial Model

		Variance - Covariance			
		Intercept	Slope on Preference for:		
			Family care	Paid home care	Relocation to a NH
Group Home	Intercept	.9195 (.1022) 81.0 **			
	Slope on Preference for:				
	Family care	.0612 (.05848) 1.09	.1841 (.06404) 8.26 **		
	Paid home care	-.2092 (.07158) 8.54 **	.07753 (.05273) 2.16	.6768 (.09068) 55.7 **	
	Relocation to a NH	-.241 (.07147) 11.37 **	-.09428 (.05073) 3.45 **	-.1251 (0.609) 4.22 **	.5746 (.8461) 46.13 **
Nursing Home	Intercept	1.667 (.1515) 121.11 **			
	Slope on Preference for:				
	Family care	0	0		
	Paid home care	.2348 (.08683) 7.31 **	0	.4975 (.09929) 25.1 **	
	Relocation to a nursing home	-.3997 (.09639) 17.2 **	0	-.4309 (.06899) 39.01 **	.3498 (.0958) 13.33 **

Note: Estimates from 1st Order MQL procedure.

** p<.01

Table 4.15 Range of Estimates of Case Manager Specific Intercepts and Slopes from Initial Multinomial Model

	Group Home v. Home Care		Nursing Home v. Home Care	
	Min	Max	Min	Max
Agency Level				
Intercept	-.51969	.71708	-.79128	1.0316
Case Manager Level				
Intercept	-1.3166	2.7264	-2.0555	4.3076
Slope on preference for:				
Paid Home Care	-.61835	.82778	-	-
Family Care	-2.0977	1.4807	-1.4165	1.7674
Relocation to a NH	-1.6519	1.9748	-1.892	.9089

TABLE I				
Summary of the results of the experiments				
Experiment	Number of subjects	Number of trials	Mean score	Standard deviation
1	10	100	75.0	15.0
2	10	100	78.0	12.0
3	10	100	72.0	18.0
4	10	100	76.0	14.0
5	10	100	74.0	16.0
6	10	100	77.0	13.0
7	10	100	73.0	17.0
8	10	100	75.0	15.0
9	10	100	76.0	14.0
10	10	100	74.0	16.0
11	10	100	77.0	13.0
12	10	100	73.0	17.0
13	10	100	75.0	15.0
14	10	100	76.0	14.0
15	10	100	74.0	16.0
16	10	100	77.0	13.0
17	10	100	73.0	17.0
18	10	100	75.0	15.0
19	10	100	76.0	14.0
20	10	100	74.0	16.0

Table 4.16 Effect of Client Variables on Type of Intervention

PARAMETER	Group Home v. Home Care						Nursing Home v. Home Care					
	B	S.E.	T	ODDS	LWR	UPR	B	S.E.	T	ODDS	LWR	UPR
Intercept	-2.13	0.38	5.59 **	0.12	0.06	0.25	-4.60	0.48	9.54 **	0.01	0.00	0.03
Physical Function (3 ADLs)	0.48	0.04	11.65 **	1.62	1.49	1.75	2.03	0.05	37.30 **	7.63	6.86	8.49
Age (> 85)	0.07	0.04	1.83 *	1.08	0.99	1.17	0.27	0.05	5.84 **	1.31	1.20	1.44
Cognitive Function (Confusion)	1.43	0.04	33.02 **	4.17	3.83	4.53	2.00	0.05	38.26 **	7.39	6.67	8.19
Health (CHF)	0.04	0.04	1.04	1.04	0.96	1.13	-0.05	0.05	1.05	0.95	0.87	1.04
Preferences: (Willing)												
Have Family Help	-0.44	0.18	2.40 **	0.64	0.45	0.92	-0.39	0.05	8.28 **	0.68	0.62	0.74
Have Formal Providers	-1.17	0.21	5.49 **	0.31	0.20	0.47	-1.15	0.23	4.95 **	0.32	0.20	0.50
Relocate	0.60	0.21	2.83 **	1.82	1.20	2.75	1.08	0.23	4.63 **	2.95	1.87	4.67
Informal Support:												
Daughter Visits Weekly	-0.38	0.05	7.77 **	0.69	0.62	0.76	-0.56	0.05	10.28 **	0.57	0.51	0.63
Daughter Visits Daily	-0.68	0.05	13.29 **	0.51	0.46	0.56	-0.95	0.06	16.25 **	0.39	0.34	0.43
Agency Budget (\$500)	-0.14	0.04	3.40 **	0.87	0.80	0.94	-0.27	0.05	5.88 **	0.76	0.69	0.83
Client Contribution:												
\$50	-0.09	0.05	1.72 *	0.92	0.83	1.01	-0.14	0.06	2.56 **	0.87	0.78	0.97
\$100	-0.16	0.05	3.27 **	0.85	0.77	0.94	-0.22	0.06	3.85 **	0.80	0.72	0.90

Reference categories are: IADL Only, Age < 85, Not Confused, Diabetes, Not Willing, No Informal Support, Agency Budget \$300, and \$0 Client Contribution.

* p < .05; ** p < .01

Table 4.17 Effect of Case Manager Variables on Intercept in Type of Intervention Model

	Group Home						Nursing Home					
				95% CI						95% CI		
	B	S.E.	T	ODDS	LWR	UPR	B	S.E.	T	ODDS	LWR	UPR
Professional Qualifications:												
Nurse Education	0.10	0.16	0.63	1.11	0.81	1.52	0.39	0.19	2.04 **	1.48	1.01	2.16
Social Work Education	0.13	0.13	0.96	1.13	0.88	1.46	0.49	0.16	3.15 **	1.64	1.21	2.23
Social Work License	0.10	0.14	0.68	1.10	0.83	1.46	0.04	0.17	0.22	1.04	0.74	1.46
Educational Level:												
Bachelors	0.04	0.18	0.21	1.04	0.73	1.48	0.07	0.21	0.34	1.07	0.71	1.63
Masters	0.10	0.22	0.48	1.11	0.73	1.69	0.10	0.25	0.38	1.10	0.67	1.81
Gender (Male)	0.02	0.16	0.10	1.02	0.74	1.39	-0.27	0.20	1.31	0.77	0.51	1.14
Task Specialization:												
Intake Only	0.38	0.24	1.60	1.47	0.92	2.34	0.97	0.29	3.38 **	2.65	1.51	4.66
Ongoing Only	-0.03	0.17	0.19	0.97	0.69	1.36	0.06	0.21	0.27	1.06	0.70	1.60
Number of Other Client Populations	0.01	0.04	0.15	1.01	0.93	1.09	0.00	0.05	0.10	1.00	0.91	1.09
Amount of Direct Care	-0.04	0.04	1.08	0.96	0.89	1.03	0.01	0.05	0.13	1.01	0.92	1.10
Ethics Other Than On The Job	-0.07	0.11	0.63	0.93	0.75	1.16	-0.26	0.14	1.90 *	0.77	0.59	1.01
Years Worked	0.01	0.01	0.81	1.01	0.99	1.03	0.02	0.01	1.63	1.02	1.00	1.04
New Cases in Last Month	-0.01	0.01	0.74	0.99	0.98	1.01	0.00	0.01	0.11	1.00	0.98	1.02
Caseload	0.00	0.00	0.34	1.00	1.00	1.00	0.00	0.00	0.09	1.00	1.00	1.00

Reference categories: no professional qualifications, no higher education, no task specialization

* p < .05; ** p < .01

Table 4.18 Effect of Case Manager Variables on Preference for Family Care in Type of Intervention Model

	Group Home			95% CI		
	B	S. E.	T	ODDS	LWR	UPR
Professional Qualifications:						
Nurse Education	0.11	0.12	0.91	1.11	0.89	1.40
Social Work Education	-0.08	0.10	0.80	0.92	0.75	1.13
Social Work License	0.09	0.10	0.84	1.09	0.89	1.33
Educational Level:						
Bachelors	0.06	0.14	0.41	1.06	0.81	1.38
Masters	0.00	0.16	0.02	1.00	0.73	1.38
Gender (Male)	-0.13	0.13	1.03	0.88	0.69	1.12
Task Specialization:						
Intake Only	-0.38	0.18	2.07 **	0.69	0.48	0.98
Ongoing Only	-0.24	0.14	1.76 *	0.79	0.60	1.03
Number of Other Client Populations	0.02	0.03	0.67	1.02	0.96	1.08
Amount of Direct Care	0.05	0.03	1.73 *	1.05	0.99	1.12
Ethics Other Than On The Job	0.00	0.09	0.02	1.00	0.84	1.19
Years Worked	-0.01	0.01	0.86	0.99	0.98	1.01
New Cases in Last Month	0.01	0.01	2.16 **	1.01	1.00	1.03
Caseload	0.00	0.00	1.31	1.00	1.00	1.00

Reference categories: no professional qualifications, no higher education, no task specialization

* p < .05; ** p < .01

Table 4.19 Effect of Case Manager Variables on Preference for Paid Home Care in Type of Intervention Model

	Group Home						Nursing Home					
	B	S. E.	T	ODDS	LWR	UPR	B	S. E.	T	ODDS	LWR	UPR
Professional Qualifications:												
Nurse Education	0.23	0.14	1.66 *	1.26	0.96	1.65	-0.14	0.13	1.07	0.87	0.67	1.12
Social Work Education	0.19	0.12	1.53	1.20	0.95	1.53	0.05	0.13	0.40	1.05	0.82	1.36
Social Work License	0.10	0.12	0.80	1.10	0.87	1.40	0.15	0.14	1.03	1.16	0.88	1.53
Educational Level:												
Bachelors	0.22	0.16	1.38	1.25	0.91	1.71	0.35	0.17	2.10 **	1.42	1.02	1.98
Masters	0.06	0.19	0.30	1.06	0.73	1.54	0.41	0.20	2.06 **	1.51	1.02	2.24
Gender (Male)	-0.09	0.15	0.58	0.92	0.69	1.23	0.00	0.18	0.00	1.00	0.71	1.41
Task Specialization:												
Intake Only	-0.74	0.22	3.36 **	0.48	0.31	0.73	-0.75	0.24	3.14 **	0.47	0.30	0.76
Ongoing Only	0.09	0.16	0.58	1.10	0.80	1.50	0.07	0.17	0.42	1.07	0.77	1.50
Number of Other Client Populations	-0.02	0.03	0.65	0.98	0.92	1.05	0.03	0.04	0.91	1.03	0.96	1.11
Amount of Direct Care	0.00	0.04	0.12	1.00	0.94	1.08	0.01	0.04	0.14	1.01	0.93	1.08
Ethics Other Than On The Job	0.11	0.11	1.09	1.12	0.91	1.38	0.12	0.11	1.04	1.13	0.90	1.40
Years Worked	0.01	0.01	0.96	1.01	0.99	1.02	0.01	0.01	1.08	1.01	0.99	1.03
New Cases in Last Month	0.01	0.01	1.77 *	1.01	1.00	1.03	0.00	0.01	0.22	1.00	0.99	1.02
Caseload	0.00	0.00	0.17	1.00	1.00	1.00	0.00	0.00	0.98	1.00	1.00	1.00

Reference categories: no professional qualifications, no higher education, no task specialization

* p < .05; ** p < .01

Table 4.20 Effect of Case Manager Variables on Preference for Relocation in Type of Intervention Model

	Group Home					Nursing Home				
	B	S.E.	T	ODDS	95% CI LWR UPR	B	S.E.	T	ODDS	95% CI LWR UPR
Professional Qualifications:										
Nurse Education	-0.23	0.14	1.70 *	0.79	0.61 1.04	-0.21	0.13	1.62	0.81	0.63 1.04
Social Work Education	-0.05	0.12	0.45	0.95	0.75 1.20	0.02	0.13	0.19	1.03	0.79 1.32
Social Work License	-0.19	0.12	1.59	0.83	0.66 1.05	-0.20	0.14	1.42	0.82	0.62 1.08
Educational Level:										
Bachelors	0.02	0.16	0.12	1.02	0.75 1.39	0.20	0.17	1.22	1.23	0.88 1.70
Masters	0.20	0.19	1.05	1.22	0.84 1.77	0.07	0.20	0.36	1.07	0.73 1.59
Gender (Male)	0.01	0.14	0.07	1.01	0.76 1.34	-0.13	0.17	0.74	0.88	0.62 1.24
Task Specialization:										
Intake Only	0.15	0.21	0.69	1.16	0.76 1.76	-0.16	0.23	0.70	0.85	0.54 1.34
Ongoing Only	-0.07	0.16	0.47	0.93	0.68 1.26	-0.16	0.17	0.96	0.85	0.61 1.18
Number of Other Client Populations	0.05	0.03	1.59	1.05	0.99 1.12	0.00	0.03	0.05	1.00	0.93 1.07
Amount of Direct Care	0.03	0.03	0.80	1.03	0.96 1.10	0.02	0.04	0.53	1.02	0.95 1.10
Ethics Other Than On The Job	-0.14	0.10	1.34	0.87	0.71 1.07	-0.02	0.11	0.16	0.98	0.79 1.22
Years Worked	-0.01	0.01	0.69	0.99	0.98 1.01	-0.01	0.01	0.62	0.99	0.98 1.01
New Cases in Last Month	-0.01	0.01	0.83	0.99	0.98 1.01	0.00	0.01	0.48	1.00	0.99 1.02
Caseload	0.00	0.00	0.05	1.00	1.00 1.00	0.00	0.00	0.45	1.00	1.00 1.00

Reference categories: no professional qualifications, no higher education, no task specialization

* p < .05; ** p < .01

Table 4.21 Effect of Agency Variables on Intercept in Type of Intervention Model

	Group Home					Nursing Home				
	B	S.E.	T	ODDS	95% CI LWR UPR	B	S.E.	T	ODDS	95% CI LWR UPR
Brokerage Model Only	-0.33	0.19	1.77 *	0.72	0.50 1.04	0.15	0.23	0.67	1.16	0.74 1.82
Provide Some Services	0.11	0.11	1.00	1.12	0.90 1.39	0.43	0.14	3.01 **	1.53	1.16 2.02
Budget (Quartiles)	0.05	0.06	0.94	1.06	0.94 1.18	0.09	0.07	1.24	1.10	0.95 1.27
Separate Intake and Ongoing Supervisory Approval:	0.01	0.10	0.09	1.01	0.84 1.22	-0.32	0.12	2.68 **	0.72	0.57 0.92
Assessments	0.01	0.14	0.09	1.01	0.77 1.33	0.33	0.17	1.88 *	1.39	0.99 1.95
Careplans	0.01	0.15	0.04	1.01	0.75 1.35	-0.50	0.19	2.60 **	0.61	0.42 0.89
Frequency of Client Monitoring	0.01	0.01	0.80	1.01	0.99 1.03	0.03	0.01	2.33 **	1.03	1.01 1.06
Frequency of Home Visits	0.03	0.01	1.85 *	1.03	1.00 1.06	0.03	0.02	1.47	1.03	0.99 1.07
Ratio of Staff to Supervisors	0.00	0.01	0.03	1.00	0.98 1.02	-0.02	0.01	1.38	0.98	0.95 1.01
Average Caseload	0.00	0.00	0.04	1.00	1.00 1.00	0.00	0.00	0.11	1.00	1.00 1.00
Number of Case Managers	0.01	0.01	0.85	1.01	0.99 1.02	0.01	0.01	0.74	1.01	0.99 1.02
State:										
Colorado	0.28	0.30	0.94	1.32	0.74 2.37	0.37	0.38	0.98	1.45	0.69 3.08
Connecticut	0.34	0.30	1.15	1.41	0.79 2.51	2.06	0.37	5.52 **	7.88	3.79 16.39
Florida	0.32	0.24	1.34	1.38	0.86 2.21	0.41	0.31	1.33	1.51	0.82 2.77
Georgia	0.38	0.30	1.26	1.46	0.81 2.65	0.38	0.39	0.97	1.46	0.68 3.14
Indiana	0.07	0.27	0.25	1.07	0.62 1.83	0.95	0.35	2.69 **	2.57	1.29 5.13
Massachusetts	-0.35	0.25	1.42	0.70	0.43 1.14	0.47	0.32	1.47	1.59	0.86 2.96
Minnesota	0.70	0.25	2.80 **	2.01	1.23 3.29	0.63	0.32	1.95 *	1.87	1.00 3.50
Ohio	-0.13	0.28	0.47	0.88	0.51 1.51	0.72	0.35	2.02 **	2.05	1.02 4.10
Washington	0.49	0.30	1.66 *	1.63	0.92 2.92	-0.86	0.39	2.19 **	0.42	0.20 0.91
Wisconsin	-0.01	0.27	0.04	0.99	0.58 1.68	0.06	0.35	0.18	1.07	0.54 2.11

Reference categories: not strictly brokerage, does not provide any services, no separation of tasks, no supervisory approval, state of California.

* $p < .05$; ** $p < .01$

Table 4.22 Summary Statistics for Each Set of Predictors in Hierarchical Multinomial Logit

Model Step:	-2 Log Likelihood	% Correctly Classified	% Improvement in Prediction ^a	% Reduction in Error
Client	9323.84	76.1	23.2	37.4
Case Manager	8983.33 **	76.3	23.6	38
Agency	8595.75 **	76.1	23.3	37.6
State	7396.79 **	79.7	29.1	46.9
Case Manager Variables Interacted With Client Preferences For:				
Paid home care	7338.73 **	79.7	29	46.9
Family Care	7237.84 **	79.7	29.1	47
Relocation	7188.96 **	79.6	28.9	46.7

Note: Estimates from 1st Order MQL procedure.

^a Compared to % correct based on choosing the modal category: 62%.

** Chi-Square of likelihood ratio test significant at $p < 0.05$.

Table 4.23 Prediction Table for Type of Intervention

		Predicted:			Total	Marginal
		Home Care	Group Home	Nursing Home		
Actual:	Home Care	7334	353	358	8045	.62
	Group Home	1068	1484	217	2769	.21
	Nursing Home	438	223	1554	2215	.17
Total:		8840	2060	2129	13029	
Marginal:		.68	.16	.16		

Table 4.24 Variances and Covariances of Random Coefficients from Preliminary Model to Predict In-Home Care v. Out-of-Home Placement

		Variance - Covariance		
Level	Intercept	Slope on Preferences for:		
		Family care	Paid home care	Relocation to a NH
Agency				
Intercept	.1824 (.1062) 2.95 *			
Slope on Preference for:				
Family Care	0	0		
Paid Home Care	.008131 (.07142) .01	0	.09546 (.08364) 1.3	
Relocation to a NH	0	0	0	0
Case Manager				
Intercept	3.448 (.2753) 156.82 **			
Slope on preference for:				
Slope on Family Care	-.2286 (.1284) 3.17 *	.6208 (.1144) 29.46 **		
Slope on paid home care	-.769 (.1717) 20.05 **	.1036 (.09922) 1.09	1.739 (.1889) 84.73 **	
Slope on Relocation	-.6811 (.1547) 19.37 **	-.1204 (.09278) 1.68	-.5294 (.1189) 19.82 **	1.381 (.1574) 77.02 **

Note: Estimates from 2nd Order PQL procedure.

** p<.01

Table 4.25 Estimates of Agency and Case Manager Specific Intercepts and Slopes From In-Home v. Out-of-Home Model

	Min	Max	Median
Agency Level			
Intercept	-.53206	.59992	.0000249
Case Manager Level			
Intercept	-3.5283	4.2136	.14092
Slope on Preferences for:			
Family Care	-1.2037	1.3469	.0036934
Paid home care	-3.5701	2.537	.10181
Relocation to a NH	-2.8435	2.955	-.033995

Table 4.26 Effect of Client Variables on Case Managers' Decision to Recommend an Out-of-Home Placement

PARAMETER	B	S.E.	T-Ratio	Odds	95% Conf. Int.	
					Lower	Upper
Intercept	-3.49	0.59	-5.95 **	0.03	0.01	0.10
Physical Function (3 ADLs)	1.59	0.05	32.05 **	4.88	4.43	5.38
Age > 85	0.22	0.05	4.89 **	1.25	1.14	1.37
Cognitive Function (Confusion)	2.41	0.05	45.25 **	11.11	10.01	12.33
Health (CHF)	0.01	0.05	0.33	1.02	0.93	1.11
Preferences: (Willing)						
Have Family Help	-0.73	0.23	-3.22 **	0.48	0.31	0.75
Have Formal Providers	-1.77	0.28	-6.24 **	0.17	0.10	0.30
Relocate	1.37	0.27	5.03 **	3.93	2.31	6.70
Agency Budget (\$500)	-0.23	0.05	-4.91 **	0.80	0.73	0.87
Client Contribution:						
\$50	-0.13	0.06	-2.37 **	0.88	0.79	0.98
\$100	-0.26	0.06	-4.57 **	0.77	0.69	0.86
Informal Support:						
Daughter Visits Weekly	-0.61	0.06	-11.09 **	0.54	0.49	0.60
Daughter Visits Daily	-1.11	0.06	-18.89 **	0.33	0.29	0.37

Reference categories are: IADL Only, Age < 85, Not Confused, Diabetes, Not Willing, No Informal Support, Agency Budget \$300, and \$0 Client Contribution.

* p < .05; p < .01

Table 4.27 Effect of Case Manager Variables on Mean Decision for Reference Case (Intercept)

PARAMETER	B	S.E.	T-Ratio	Odds	95% Conf. Int.	
					Lower	Upper
Professional Qualifications:						
Social Work Education	0.34	0.20	1.75 *	1.41	0.96	2.07
Social Work License	-0.06	0.22	-0.27	0.94	0.62	1.44
Nurse Education	0.17	0.24	0.68	1.18	0.73	1.90
Educational Level:						
Bachelors	0.07	0.27	0.25	1.07	0.63	1.80
Masters	0.18	0.32	0.55	1.19	0.64	2.23
Gender (Male)	0.04	0.24	0.18	1.04	0.65	1.68
Task Specialization:						
Intake Only	0.76	0.35	2.15 **	2.14	1.07	4.28
Ongoing Only	0.08	0.26	0.31	1.08	0.65	1.81
Number of Other Client Populations	0.01	0.06	0.09	1.01	0.90	1.13
Amount of Direct Care	-0.03	0.06	-0.54	0.97	0.87	1.08
Ethics Other Than On The Job	-0.06	0.17	-0.38	0.94	0.67	1.30
Years Worked	0.02	0.01	1.43	1.02	0.99	1.05
New Cases in Last Month	0.00	0.01	-0.14	1.00	0.97	1.02
Caseload	0.00	0.00	0.31	1.00	1.00	1.00

Reference categories: no professional qualifications, no higher education, no task specialization

* p < .05; p < .01

Table 4.28 Effect of Case Manager Factors on Importance of Client Preference for Family Care

PARAMETER	B	S.E.	T-Ratio	Odds	95% Conf. Int.	
					Lower	Upper
Professional Qualifications:						
Social Work Education	0.01	0.13	0.05	1.01	0.78	1.30
Social Work License	-0.01	0.13	-0.11	0.99	0.76	1.27
Nurse Education	0.16	0.15	1.09	1.17	0.88	1.57
Educational Level:						
Bachelors	0.18	0.17	1.04	1.19	0.86	1.66
Masters	0.05	0.20	0.22	1.05	0.70	1.56
Gender (Male)	-0.31	0.16	-1.94 *	0.73	0.54	1.00
Task Specialization:						
Intake Only	-0.28	0.23	-1.23	0.75	0.48	1.18
Ongoing Only	-0.23	0.17	-1.35	0.80	0.57	1.11
Number of Other Client Populations	0.00	0.04	-0.12	1.00	0.93	1.07
Amount of Direct Care	0.05	0.04	1.45	1.06	0.98	1.14
Ethics Other Than On The Job	-0.05	0.11	-0.43	0.95	0.77	1.19
Years Worked	0.00	0.01	-0.17	1.00	0.98	1.02
New Cases in Last Month	0.02	0.01	2.44 **	1.02	1.00	1.04
Caseload	0.00	0.00	-0.99	1.00	1.00	1.00

Reference categories: no professional qualifications, no higher education, no task specialization

* $p < .05$; $p < .01$

Table 4.29 Effect of Case Manager Factors on Importance of Client Preference for Paid Home Care

PARAMETER	B	S.E.	T-Ratio	Odds	95% Conf. Int.	
					Lower	Upper
Professional Qualifications:						
Social Work Education	0.11	0.16	0.68	1.12	0.81	1.54
Social Work License	0.23	0.16	1.39	1.25	0.91	1.73
Nurse Education	0.29	0.19	1.57	1.34	0.93	1.92
Educational Level:						
Bachelors	0.41	0.21	1.91 *	1.50	0.99	2.29
Masters	0.25	0.26	0.98	1.28	0.78	2.12
Gender (Male)	-0.13	0.20	-0.66	0.88	0.59	1.30
Task Specialization:						
Intake Only	-0.87	0.30	-2.93 **	0.42	0.23	0.75
Ongoing Only	0.09	0.21	0.44	1.10	0.73	1.66
Number of Other Client Populations	0.01	0.04	0.26	1.01	0.93	1.10
Amount of Direct Care	0.03	0.05	0.68	1.03	0.94	1.13
Ethics Other Than On The Job	0.14	0.14	0.99	1.15	0.87	1.51
Years Worked	0.01	0.01	0.83	1.01	0.99	1.03
New Cases in Last Month	0.01	0.01	0.75	1.01	0.99	1.03
Caseload	0.00	0.00	0.07	1.00	1.00	1.00

Reference categories: no professional qualifications, no higher education, no task specialization

* $p < .05$; $p < .01$

Table 4.30 Effect of Case Manager Factors on Importance of Client Preference for Relocation

PARAMETER	B	S.E.	T-Ratio	Odds	95% Conf. Int.	
					Lower	Upper
Professional Qualifications:						
Social Work Education	-0.27	0.15	-1.78 *	0.76	0.56	1.03
Social Work License	-0.05	0.16	-0.31	0.95	0.70	1.29
Nurse Education	-0.25	0.18	-1.44	0.78	0.55	1.10
Educational Level:						
Bachelors	0.05	0.20	0.22	1.05	0.70	1.56
Masters	0.17	0.24	0.69	1.18	0.73	1.91
Gender (Male)	-0.05	0.19	-0.24	0.96	0.66	1.39
Task Specialization:						
Intake Only	0.18	0.27	0.66	1.20	0.70	2.05
Ongoing Only	-0.21	0.20	-1.06	0.81	0.55	1.20
Number of Other Client Populations	0.04	0.04	0.90	1.04	0.96	1.13
Amount of Direct Care	0.01	0.04	0.30	1.01	0.93	1.11
Ethics Other Than On The Job	-0.13	0.13	-0.97	0.88	0.68	1.14
Years Worked	-0.01	0.01	-0.91	0.99	0.97	1.01
New Cases in Last Month	-0.01	0.01	-0.86	0.99	0.97	1.01
Caseload	0.00	0.00	-0.09	1.00	1.00	1.00

Reference categories: no professional qualifications, no higher education, no task specialization

* $p < .05$; $p < .01$

Table 4.31 Effect of Agency Factors on Mean Decision for Reference Case (Intercept)

					95% Conf. Int.		
PARAMETER	B	S.E.	T-Ratio	Odds	Lower	Upper	
Brokerage Model Only	-0.15	0.29	-0.52	0.86	0.49	1.51	
Provide Some Services	0.37	0.18	2.08 **	1.44	1.02	2.04	
Budget (Quartiles)	0.11	0.09	1.23	1.12	0.94	1.34	
Separate Intake and Ongoing	-0.17	0.15	-1.10	0.85	0.63	1.14	
Supervisory Approval: Assessments	0.01	0.22	0.05	1.01	0.66	1.54	
Careplans	-0.18	0.24	-0.78	0.83	0.52	1.32	
Frequency of Client Monitoring	0.02	0.02	1.16	1.02	0.99	1.06	
Frequency of Home Visits	0.04	0.02	1.68 *	1.04	0.99	1.09	
Ratio of Staff to Supervisors	-0.02	0.02	-0.90	0.98	0.95	1.02	
Average Caseload	0.00	0.00	0.23	1.00	1.00	1.01	
Number of Case Managers	0.01	0.01	0.87	1.01	0.99	1.03	
State:	Colorado	0.41	0.47	0.88	1.51	0.60	3.80
	Connecticut	1.67	0.47	3.58 **	5.31	2.13	13.25
	Florida	0.42	0.38	1.09	1.51	0.72	3.19
	Georgia	0.26	0.48	0.55	1.30	0.51	3.34
	Indiana	0.64	0.43	1.47	1.89	0.81	4.43
	Massachusetts	-0.01	0.39	-0.04	0.99	0.46	2.11
	Minnesota	0.85	0.40	2.14 **	2.34	1.08	5.09
	Ohio	0.40	0.44	0.90	1.48	0.63	3.50
	Washington	0.08	0.47	0.18	1.09	0.43	2.72
	Wisconsin	0.16	0.43	0.38	1.18	0.51	2.72

Reference categories: not strictly brokerage, does not provide any services, no separation of tasks, no supervisory approval, state of California.

* $p < .05$; $p < .01$

Table 4.32 Summary Statistics for Each Set of Predictors of In-Home v. Out-Of-Home Model

Model Step:	-2 Log Likelihood	% Correctly Classified	% Improvement in Prediction ^a	% Reduction in Error
Client	3364	86.6	40.3	65
Case Manager	3418 **	86.6	40.3	65
Agency	3335 **	86.8	40.7	65.6
State	3301 **	84.7	37.2	60
Case Manager Variables Interacted With Client Preferences For:				
Paid home care	3282	84.8	37.4	60.3
Family Care	3282	84.9	37.6	60.5
Relocation to a NH	3218 **	86.5	40.3	64.9

Note: Estimates from 2nd Order PQL procedure.

^a Compared to % correct based on choosing the modal category: 61.7%

** Chi-Square of likelihood ratio test significant at $p < 0.05$.

Table 4.33 Prediction Table for In-Home v. Out-of-Home Model

		Predicted		Total	Marginal
		In-Home	Out-of-Home		
Actual	In-Home	7253	792	8045	.62
	Out-of-Home	960	4024	4984	.38
Total:		8213	4816	13029	
Marginal:		.63	.37		

Table 4.34 Variances and Covariances of Random Coefficients from Preliminary Model to Predict Group Home v. Nursing Home

		Variance - Covariance		
Level	Intercept	Slope on Preference for:		
		Family care	Paid home care	Relocation to a nursing home
Agency				
Intercept	1.21 (.3134) 14.92 **			
Slope on Preference for:				
Family Care	-.02131 (.1453) .05	.06358 (.1229) .27		
Paid home care	-.1285 (.1535) .7	.006631 (.08987) .01	.07048 (.1317) .29	
Relocation to a NH	0	0	0	0
Case Manager				
Intercept	4.463 (.4714) 89.63 **			
Slope on Preference for:				
Family Care	-.4795 (.2604) 3.39 *	1.463 (.2667) 30.1 **		
Paid home care	-.3601 (.2674) 1.81	.06563 (.1800) .12	1.664 (.2843) 34.27 **	
Relocation to a NH	-1.433 (.3005) 22.76 **	.1018 (.1929) .28	-.3695 (.2014) 3.37 *	2.43 (.3182) 58.3 **

Note: Estimates from 2nd Order PQL procedure.

** p<.01; * p < .05

Table 4.35 Estimates of Agency and Case Manager Specific Intercepts and Slopes From Group Home v. Nursing Home Model

	Min	Max	Median
Agency Level			
Intercept	-1.4164	1.5745	-.0349225
Case Manager Level			
Intercept	-3.0794	6.3622	-.271515
Slope on Family Care	-2.6804	2.7288	-.0011924
Slope on paid home care	-3.0928	2.8352	-.043175
Slope on Relocation	-4.6788	3.8162	.020752

Table 4.36 Effect of Client Variables on Case Managers' Decision to Recommend a Nursing Home vs. Group Home

PARAMETER	B	S.E.	T-Ratio	Odds	95% Conf. Int.	
					Lower	Upper
Intercept	-5.67	0.94	-6.03 **	0.00	0.00	0.02
Physical Function (3 ADLs)	2.95	0.09	31.33 **	19.18	15.95	23.08
Age > 85	0.34	0.07	4.82 **	1.41	1.23	1.62
Cognitive Function (Confusion)	1.57	0.09	17.77 **	4.80	4.04	5.71
Health (CHF)	-0.06	0.07	-0.85	0.94	0.82	1.08
Preferences: (Willing)						
Have Family Help	-0.23	0.42	-0.55	0.79	0.34	1.82
Have Formal Providers	-0.18	0.44	-0.41	0.84	0.35	1.99
Relocate	1.53	0.49	3.15 **	4.62	1.78	11.97
Agency Budget (\$500)	-0.12	0.07	-1.69 *	0.88	0.77	1.02
Client Contribution:						
\$50	-0.15	0.09	-1.66 *	0.86	0.73	1.03
\$100	-0.15	0.09	-1.67 *	0.86	0.72	1.03
Informal Support:						
Daughter Visits Weekly	-0.39	0.08	-4.55 **	0.68	0.58	0.80
Daughter Visits Daily	-0.51	0.09	-5.50 **	0.60	0.50	0.72

Reference categories are: IADL Only, Age < 85, Not Confused, Diabetes, Not Willing, No Informal Support, Agency Budget \$300, and \$0 Client Contribution.

* p < .05; ** p < .01

Table 4.37 Effect of Case Manager Variables on Mean Decision for Reference Case (Intercept)

PARAMETER	B	S.E.	T-Ratio	Odds	95% Conf. Int.	
					Lower	Upper
Professional Qualifications:						
Social Work Education	0.61	0.32	1.93 *	1.84	0.99	3.43
Social Work License	-0.19	0.35	-0.56	0.82	0.42	1.63
Nurse Education	0.48	0.38	1.27	1.62	0.77	3.40
Educational Level:						
Bachelors	0.11	0.43	0.26	1.12	0.48	2.58
Masters	0.11	0.51	0.22	1.12	0.41	3.04
Gender (Male)	-0.48	0.41	-1.19	0.62	0.28	1.37
Task Specialization:						
Intake Only	0.67	0.57	1.18	1.96	0.64	5.99
Ongoing Only	0.58	0.42	1.38	1.78	0.78	4.07
Number of Other Client Populations	0.07	0.09	0.73	1.07	0.89	1.29
Amount of Direct Care	0.01	0.09	0.14	1.01	0.85	1.21
Ethics Other Than On The Job	-0.13	0.27	-0.49	0.87	0.51	1.49
Years Worked	0.01	0.02	0.31	1.01	0.96	1.05
New Cases in Last Month	0.02	0.02	0.98	1.02	0.98	1.06
Caseload	0.00	0.00	-0.16	1.00	0.99	1.01

Reference categories: no professional qualifications, no higher education, no task specialization

* p < .05; ** p < .01

Table 4.38 Effect of Case Manager Factors on Importance of Client Preference for Family Care

PARAMETER	B	S.E.	T-Ratio	Odds	95% Conf. Int.	
					Lower	Upper
Professional Qualifications:						
Social Work Education	-0.47	0.24	-1.92 *	0.63	0.39	1.01
Social Work License	0.55	0.24	2.26 **	1.74	1.08	2.80
Nurse Education	0.15	0.27	0.54	1.16	0.68	1.96
Educational Level:						
Bachelors	0.04	0.32	0.14	1.04	0.56	1.95
Masters	0.06	0.38	0.15	1.06	0.50	2.22
Gender (Male)	-0.04	0.31	-0.11	0.97	0.52	1.78
Task Specialization:						
Intake Only	0.50	0.43	1.18	1.65	0.72	3.81
Ongoing Only	0.08	0.32	0.25	1.08	0.58	2.04
Number of Other Client Populations	-0.03	0.06	-0.52	0.97	0.85	1.10
Amount of Direct Care	-0.02	0.07	-0.27	0.98	0.86	1.12
Ethics Other Than On The Job	-0.12	0.21	-0.55	0.89	0.59	1.34
Years Worked	0.01	0.02	0.48	1.01	0.98	1.04
New Cases in Last Month	0.00	0.02	-0.31	1.00	0.97	1.03
Caseload	0.00	0.00	0.56	1.00	1.00	1.01

Reference categories: no professional qualifications, no higher education, no task specialization

* $p < .05$; ** $p < .01$

Table 4.39 Effect of Case Manager Factors on Importance of Client Preference for Paid Home Care

PARAMETER	B	S.E.	T-Ratio	Odds	95% Conf. Int.	
					Lower	Upper
Professional Qualifications:						
Social Work Education	-0.09	0.25	-0.38	0.91	0.56	1.48
Social Work License	-0.09	0.25	-0.37	0.91	0.56	1.49
Nurse Education	-0.17	0.28	-0.61	0.84	0.49	1.45
Educational Level:						
Bachelors	0.09	0.33	0.26	1.09	0.57	2.07
Masters	0.45	0.39	1.17	1.57	0.74	3.34
Gender (Male)	0.35	0.32	1.07	1.41	0.75	2.67
Task Specialization:						
Intake Only	-0.01	0.45	-0.02	0.99	0.41	2.42
Ongoing Only	-0.17	0.32	-0.52	0.85	0.45	1.59
Number of Other Client Populations	0.07	0.07	1.05	1.07	0.94	1.23
Amount of Direct Care	0.01	0.07	0.14	1.01	0.88	1.16
Ethics Other Than On The Job	0.03	0.22	0.16	1.03	0.68	1.58
Years Worked	0.00	0.02	-0.06	1.00	0.97	1.03
New Cases in Last Month	-0.01	0.02	-0.90	0.99	0.96	1.02
Caseload	0.00	0.00	-1.08	1.00	0.99	1.00

Reference categories: no professional qualifications, no higher education, no task specialization

* $p < .05$; ** $p < .01$

Table 4.40 Effect of Case Manager Factors on Importance of Client Preference for Relocation

PARAMETER	B	S.E.	T-Ratio	Odds	95% Conf. Int.	
					Lower	Upper
Professional Qualifications:						
Social Work Education	-0.18	0.27	-0.66	0.84	0.49	1.43
Social Work License	-0.09	0.28	-0.32	0.92	0.53	1.57
Nurse Education	-0.18	0.30	-0.58	0.84	0.46	1.52
Educational Level:						
Bachelors	0.00	0.36	0.01	1.00	0.49	2.05
Masters	-0.24	0.43	-0.56	0.78	0.34	1.83
Gender (Male)	-0.05	0.35	-0.14	0.95	0.48	1.88
Task Specialization:						
Intake Only	-0.32	0.47	-0.67	0.73	0.29	1.84
Ongoing Only	-0.64	0.36	-1.81 *	0.53	0.26	1.06
Number of Other Client Populations	-0.18	0.07	-2.51 **	0.83	0.72	0.96
Amount of Direct Care	-0.02	0.08	-0.29	0.98	0.84	1.14
Ethics Other Than On The Job	0.18	0.24	0.78	1.20	0.76	1.91
Years Worked	0.02	0.02	1.17	1.02	0.99	1.06
New Cases in Last Month	0.00	0.02	-0.18	1.00	0.96	1.03
Caseload	0.00	0.00	0.97	1.00	1.00	1.01

Reference categories: no professional qualifications, no higher education, no task specialization

* p < .05; ** p < .01

Table 4.41 Effect of Agency Factors on Mean Decision for Reference Case (Intercept)

PARAMETER	B	S.E.	T-Ratio	Odds	95% Conf. Int.	
					Lower	Upper
Brokerage Model Only	0.93	0.44	2.11 **	2.54	1.07	6.02
Provide Some Services	0.40	0.28	1.44	1.49	0.87	2.55
Budget (Quartiles)	0.05	0.14	0.37	1.05	0.80	1.38
Separate Intake and Ongoing	-0.30	0.23	-1.30	0.74	0.47	1.16
Supervisory Approval: Assessments	0.35	0.33	1.07	1.42	0.75	2.71
Careplans	-0.85	0.36	-2.33 **	0.43	0.21	0.88
Freq of Client Monitoring	0.04	0.03	1.49	1.04	0.99	1.10
Freq of Home Visits	0.04	0.04	1.23	1.04	0.97	1.12
Ratio of Staff to Supervisors	-0.01	0.03	-0.34	0.99	0.94	1.05
Average Caseload	0.00	0.00	0.42	1.00	0.99	1.01
Number of Case Managers	-0.01	0.02	-0.30	0.99	0.96	1.03
State:						
Colorado	0.27	0.73	0.37	1.31	0.31	5.53
Connecticut	2.48	0.70	3.53 **	11.99	3.02	47.67
Florida	0.22	0.59	0.38	1.25	0.39	3.95
Georgia	0.16	0.74	0.22	1.17	0.28	4.97
Indiana	1.78	0.67	2.65 **	5.92	1.59	22.08
Massachusetts	1.45	0.61	2.39 **	4.28	1.30	14.09
Minnesota	-0.02	0.60	-0.04	0.98	0.30	3.15
Ohio	1.63	0.67	2.42 **	5.11	1.36	19.14
Washington	-2.18	0.74	-2.95 **	0.11	0.03	0.48
Wisconsin	0.05	0.66	0.08	1.05	0.29	3.81

Reference categories: not strictly brokerage, does not provide any services, no separation of tasks, no supervisory approval, state of California.

* p < .05; ** p < .01

Table 4.42 Summary Statistics for Each Set of Predictors in Group Home v. Nursing Home Model

Model Step:	-2 Log Likelihood	% Correctly Classified	% Improvement in Prediction ^a	% Reduction in Error
Client	663	90	61.9	77.5
Case Manager	653	91	63.7	79.8
Agency	591	92.2	65.9	82.5
State	-238	85.6	53.9	67.5
Case Manager Variables Interacted With Client Preferences For:				
Paid home care	-249	85.3	53.3	66.8
Family Care	-267	85.3	53.5	67
Relocation to a NH	-267	93.9	69	86.4

Note: Estimates from 2nd Order PQL procedure.

^a Compared to % correct based on choosing the modal category: 56%

** Chi-Square of likelihood ratio test significant at $p < 0.05$.

Table 4.43 Prediction Table for Group Home v. Nursing Model

		Predicted		Total	Marginal
		Group Home	Nursing Home		
Actual	Group Home	2627	160	2787	.56
	Nursing Home	142	2055	2197	.44
Total:		2769	2215	4984	
Marginal:		.56	.44		

CHAPTER 5: SUMMARY OF FINDINGS

This chapter summarizes the significant findings described in detail in the previous chapter and discusses the impact of these effects on case manager decision making in relation to the hypotheses presented in Chapter 3. In contrast to Chapter 4, which reported actual significance levels for each finding, this chapter discusses only findings significant at the $p < .01$ level. Also, to avoid overly capitalizing on chance, on the tables of case manager and agency effects, attention is only paid to variables that were significant in two or more models. These are referred to as 'consistent' effects, because they were consistent across the different specifications of the empirical model.

Five models were estimated: (1) the decision to intervene in a case, (2) to recommend an out-of-home placement versus home care, (3) to recommend a group home versus a nursing home, (4) to recommend a group home versus home care, and (5) to recommend a nursing home versus home care. The effects of each set of independent variables (client, case manager, and agency) are discussed for each model. In addition to the measured independent case manager variables, unmeasured individual-specific effects were estimated.

5.1 Effects of Client Variables

5.1.1 Case managers' care plan recommendations are a function of client preferences, risk factors and the available resources ($H_{1.0}$)

The client variables described in the vignettes all had consistent effects in each regression model. Variables that describe risk factors (physical function, age, cognitive function) with the exception of health, consistently predicted a greater likelihood that case managers would recommend: any intervention at all; an out-of-home placement compared to home care; a nursing home compared to group home; a group home compared to home care and a nursing home compared to home care (Table 5.1). The health variable, which described different types of health needs (CHF v. Diabetes) was significant only in the decision to intervene at all. The

CHF level, which represented a chronic health problem requiring monitoring, led to a lower likelihood of an intervention compared to diabetes, which represented a chronic condition requiring ongoing treatment.

Variables that describe client resources (monetary and family caregiving) consistently predicted a lower likelihood of case managers' recommending: any intervention at all; an out-of-home placement compared to home care; a nursing home compared to group home; a group home compared to home care and a nursing home compared to home care (Table 5.1).

However, monetary resources (both client contribution and agency budget) did not affect the decision to intervene or the decision to recommend a nursing home versus a group home. And, in general, monetary resources had smaller effects than family caregiving (i.e. close to one). The range of odds ratios for monetary resources was .88 to .8 and averaged .83 whereas the odds ratios for family caregiving ranged from .76 to .28 and averaged .6.

When clients' preferences were described as being willing to have family help, case managers were less likely to recommend any out-of-home placement compared to home care. In the model that separated the type of out-of-home placement into group home and nursing home, case managers were less likely to recommend either option for clients who were willing to have family help out. Client preferences for family care did not affect the overall decision to intervene or the decision to recommend a group home versus a nursing home.

Clients who were described as being willing to have formal providers help with their care were much more likely to have any type of intervention recommended, and were less likely to have any form of out-of-home placement. When the type of out-of-home placement was separated into group home and nursing home, case managers were less likely to recommend either option for clients who were willing to have formal providers. Client preferences for paid home care did not affect the decision to recommend a group home versus a nursing home.

When clients were described as being willing to consider relocation to a nursing home, case managers were much more likely to recommend an out-of-home placement. In the model

that separated the type of out-of-home placement into group home and nursing home, case managers were more likely to recommend either option for clients who are willing to consider relocation. Finally, for clients who had an out-of-home placement recommendation, those who were willing to consider relocating to a nursing home were much more likely to have a nursing home than a group home recommendation.

To get a sense of the relative importance of preferences in case managers' decision making, the odds ratio of each preference variable can be compared to the effects of other variables. The effect of physical disability is a convenient reference point because it has high external validity (e.g. the effect of three ADLs compared to IADL only). In general, the relative importance of preferences to physical disability varied across the different empirical specifications. In the decision to intervene, the odds ratio of increased disability was 3.7 and the odds ratio of willingness to have formal providers was 13.29. Preferences were thus 3.7 times as important as disability in this context.

In the decision to recommend an out of home placement versus home care, the most important factor was cognitive status (OR 11.1). Physical function increased the odds of an out of home placement by a factor of 4.9, and being willing to have formal providers decreased the odds by a factor of 6 (1/.17). Client willingness to consider relocation to a nursing home increased the odds by a factor of 3.93. In this decision, therefore, preferences had roughly the same level of importance as physical disability.

Preferences were nearly twice as important than physical function in the decision to recommend a group home versus home care. Willingness to have paid home care reduced the odds of a group home placement by a factor of 3.2, while increased disability increased the odds by a factor of 1.6. By contrast, in the decision to recommend a nursing home placement, physical function was more than twice as important as preference. Physical disability increased the odds of a nursing home placement by 7.63, and willingness to have paid home care decreased the odds of a nursing home placement by a factor of 3.2.

Table 5.2 shows the effect of increasing risk factors on the different dependent variables. The predicted probabilities were calculated by using the estimated coefficients on client variables in the standard expression for the logit transformation. In Table 5.2, the only variables that change are the risk factors; each row adds a risk factor to the row above it. Available resources, family caregiving, and preferences are held constant at the reference category (i.e. low resources, no family, and not willing to have family care, paid home care or consider relocation). Case manager and agency characteristics are held at their reference categories. As was expected, each additional risk factor increased the odds that a case manager would recommend: (1) an intervention versus continuing to monitor the client; (2) an out of home placement versus home care; (3) a nursing home versus home care; (4) a nursing home versus a group home; (5) and a group home versus home care.

It is apparent from Table 5.2 that the addition of cognitive disability (bottom row) to the client description crosses a critical threshold. When the client was described as having only physical disability and advanced age, the probability of an out of home placement was only .16. However, the addition of cognitive disability increased this probability to .67.

Taking as an example the context of low resources and no family caregiving, Table 5.3 shows the predicted probability of an out of home placement for a client with and without cognitive disability. (The probability of intervening is close to one in each of these situations.) Each column shows a different combination of preferences for having family care and paid home care. Reading from left to right, the client changes from being willing to have both family care and paid home care to not being willing to have either. The probability of an out of home placement increased for both the cognitively intact and the confused client, however, only for the cognitively disabled client intact client who does not want paid home care, would the case manager recommend an out of home placement. Other observations were:

- ▶ When clients were unwilling to accept help in their own homes, case managers were more likely to over-ride their preference not to relocate to a nursing home.

- ▶ When clients were cognitively intact, case managers were willing to over-ride their preference for not having in-home care.
- ▶ When clients were described as confused, case managers over-rode their preference for not relocating to a nursing home.

Table 5.4 shows the different combinations of client preferences and availability of family caregiving. As noted above, when clients were described as most disabled and not willing to have family care or paid home care, case managers were most likely to recommend an out of home placement (.67). For equally disabled clients who were willing to have family care and were receiving weekly or daily help from a family member, case managers were unlikely to recommend an out of home placement (.35; .25). However, in the cases where clients were receiving care that they did not want, or not receiving care that they did want, the probability that case managers would recommend an out of home placement was intermediate. For clients who were willing to have family help out but had no family available, the probability was .5. For clients who did not want family help when their daughter was visiting weekly to help out, the probability of an out of home placement was .53.

5.1.2 Effect of Client Preferences for Sub-Groups of Clients

This section extends the analysis by focusing on small, relevant subsets of the data in order to answer two key questions. First, are there sub-groups of clients for whom preferences are expected to matter more? Second, what is the effect of combinations of client preferences on particular decisions for specific types of clients?

The approach to analyzing the effects of client preferences presented in Section 5.1.1 treats each preference independently from the others and from client risk factors. All preferences and risk factors were regressed on each decision point. However, it is possible that case managers place different weight on client preferences in the presence of other client factors

such as a high level of physical disability or cognitive disability. For example, case managers may not simply balance risk factors against preferences, but may place less importance on preferences in the presence of high risk than low risk. Such an effect could be termed 'discounting'. It is also possible that case managers may attend to the preferences of cognitively disabled clients to a lesser degree or not at all. The first part of this section extends the analysis to consider the possibility that preferences matter differently for different types of clients. The overall goal is to identify sub-groups of clients where preferences may be expected to matter most. This provides the strongest test of the main study aim, i.e. to determine if case managers take client preferences into account. These results will be used in subsequent models to help focus the analysis of the effects of case manager characteristics on the importance placed on client preferences.

The second part of this section will examine the effects of combinations of client preferences on particular decisions. Predictions can be made about case managers' decisions for certain combinations of client characteristics.

Figure 5.1 shows the relative importance placed on client preferences for the four possible combinations of physical and cognitive disability. As noted above, both physical and cognitive risk factors are hypothesized to diminish the weight case managers place on client preferences. In general, case managers are hypothesized to advocate for client preferences. However, when preferences conflict with what case managers feel is in their clients' best interest (e.g. client health and safety), the importance placed on preferences will diminish. Case managers thus shift from an advocacy mode to an agency mode. Note that on normative grounds, the preferences of more disabled clients *should* get more rather than less weight. In other words, keeping with the importance placed on autonomy in our society, case managers should pay at least as much, or more attention to the stated preferences of disabled elderly who cannot do things for themselves. However, empirical data from previous studies suggest that this is not the case (e.g., Hennessy, 1989; Clemens et al., 1994). Instead, case managers have

been observed to downgrade the importance of preferences of more disabled clients.

It is hypothesized that the preferences of cognitively disabled clients will have less weight than the preferences of cognitively intact clients. It is a common problem in health care that people who do not appear capable of making decisions for themselves do not have their stated preferences followed. The movement to have people develop written living wills is a response to this problem. Typically, a proxy decision maker will try to use their own judgment to 'substitute' for what the person would have wanted, or else a best interest standards is usually used. In the present study, information about the preferences of the confused client was part of the vignette. The empirical question of whether case managers use this information is analogous to whether they follow the preferences as given or follow a 'best interest' or agency model. Finally, the preferences of clients with both risk factors will have the lowest weight of all. (Variation among case managers in each factor will be presented in Section 5.2.3, below.)

Figure 5.2 shows, for each preference taken independently and each dependent variable, the direction of the effect on the dependent variable, and the expected outcome. Each cell is further broken down into low and high risk categories; the cognitively disabled sub-groups are dropped because preferences are expected to have relatively weak effects for such clients. For example, the effect of wanting to have family care (but not formal care and will not consider relocation) is to reduce the likelihood that a case manager will recommend an intervention. The effect of the preferences should be the same for low risk and high risk groups (although as noted above and in Figure 5.1, the magnitude should be greater for the low risk group). However, the overall recommendation will be different for low risk and high risk clients. Case managers will recommend some intervention for high risk clients who prefer only to have family care. This will occur for three reasons. First, the probability of an intervention due to the presence of increased disability will outweigh the protective effect of not wanting any services (this is a balancing effect). Second, preferences are less effective at higher levels of risk (this is an interaction effect). Thirdly, the conventional wisdom is that case managers are interventionists. They

believe in the services they offer, and prefer to impose on a client's privacy and autonomy and have some minimal level of services in place. The alternative is that the client may not remain eligible for case management, and would not be able to quickly access the system if they develop a stronger need in the future.

The direction of the effect of preference for having formal care and willingness to relocate to a nursing home is in the positive direction. That is, clients who are willing to have some service or consider relocation are more likely to have one or the other. This is not controversial.

With regard to the type of intervention, whether it is a recommendation for home care or an out-of-home placement, the effect of client preferences for having formal care is expected to be negative. Case managers' overall recommendation will be for home care, however it must be noted that this type of client does not want any formal home care services. Hence the low risk cell represents an ethically troubling situation for the case manager. The fact that there is any intervention at all for such clients is problematic; as noted above, case managers are interventionists by nature. However, in this situation, it is likely that case managers will over-ride client preferences not to have formal home care instead of their preference not to relocate.

Finally, the bottom row of Figure 5.2 shows the expected direction of the effect of preferences for relocating to a nursing home on the decision to recommend an out-of-home placement. It is anticipated that this preference will increase the odds of such a recommendation, however case managers will not recommend it for low risk clients. This is because the preference, as stated in the vignette, is not a demand for a placement. Rather, it is stated as a willingness to consider it, if needed. Case managers will therefore consider what is appropriate as well as what is prudent, and recommend home care, even though this is contrary to the clients' preference not to have formal home care.

Table 5.5 shows the coefficients for each of the three preferences and the predicted

probabilities for each⁹ for the decision to recommend some intervention versus home care. As was hypothesized on Figure 5.2, both being willing to have formal care and consider relocation to a nursing home increases the odds of an intervention for all types of clients. Being willing to have family care had a negative, but not statistically significant effect. For example, the predicted probability of an intervention (versus continued monitoring) for low risk cognitively intact clients who are willing to have formal care was .92, while the probability for a similarly disabled client who was not willing to have formal care was .63 (the intercept).

The relative importance of preferences for different types of clients did not completely follow the expectations presented in Figure 5.1. The data show that, for both cognitively intact and cognitively disabled sub-groups, as physical disability increased, the weight placed on preferences increased. For example, the odds ratio on preference for formal care increased nearly two-fold from 6.5 to 13 for low compared to high physical disability groups. However, comparing cognitively intact to cognitively disabled clients at the same risk level shows that disability does diminish the weight placed on preferences. The odds ratios on client preferences for formal care drops by a factor of 1.5, from 6.5 to 4.2 for low risk clients, and nearly two-fold, from 13 to 7, for high risk clients. The pattern for preferences for relocation is less clear; there is a slight drop for high risk clients (2.4 to 2.1) but a small, probably insignificant, increase for low risk clients (1.5 to 1.6).

The overall recommendations for each cell on Table 5.5 is to have some intervention, regardless of preferences. The prediction that low risk clients who preferred only family care (or no services at all, for that matter) would have a recommendation for continued monitoring was not supported. This occurred partly because preferences for family care did not have the anticipated protective effect. It must be noted that the data were skewed away from monitoring (see Table 4.4). This may be because the explanation that case managers are generally

⁹The predicted probability was evaluated for the intercept and each of the preference variables by calculating the anti-logit ($\exp(a+\beta x)/[1+\exp(a+\beta x)]$) where a is the intercept, β is the coefficient on the preference of interest, and x is an indicator (i.e., $x = 1$).

interventionist in approach is correct, or else it is an artifact of the vignette design (i.e., the level of unmet need in the vignettes was high).

Table 5.6 shows the same results for the decision to recommend an out-of-home placement versus an in-home care plan. As above, client preferences effect case managers' recommendations in the expected directions. Preference for family care decreases the odds of an out-of-home placement (i.e., increases the odds of a home care recommendation) for each of the four sub-groups (.6; .71; .76; .70). For low risk, cognitively intact clients who are willing to have family care, the predicted probability of an out-of-home placement drops to .08 from .12. Preference for formal care also decreases the odds of an out-of-home placement for each of the four subgroups (.16; .39; .55; .58). And preference for relocation to a nursing home increases the odds of an out-of-home placement for each of the four sub-groups (4.44, 2.75, 1.75, 1.84).

The relative weight placed on each preference generally follows the pattern presented in Figure 5.1. For cognitively intact clients, the odds ratios in the low risk subgroup are larger than for the high risk subgroup. Preference for family care decreases from .6 to .71; preference for formal care decreases from .16 to .39 and preference for relocation decreases from 4.44 to 2.75. Comparing low risk cognitively intact to cognitively disabled also shows the expected pattern. Preference for family care decreases from .6 to .76; preference for formal care decreases from .16 to .55 and preference for relocation decreases from 4.44 to 1.75. The same pattern is observed when high risk cognitively intact to cognitively disabled groups, with the sole exception of preference for family care which is not statistically significant in cognitively intact sub-group.

A difference emerges, however, when comparing low risk to high risk cognitively disabled clients. The shifts are substantially smaller than for the cognitively intact subgroups, and the direction is not consistent. Preference for family care and relocation increase in importance, contrary to expectation, while preference for formal care decreases as expected. Although statistical tests for these shifts are not readily available, the fact that these shifts are all about one tenth of a unit (on the odds ratio scale) suggests that they are not significant. (By

contrast, for all other pairs of statistically significant coefficients compared in this section, the differences are at twice that size and typically 10 times that size.)

Finally, considering the outcomes of recommendations, the predicted probabilities in Table 5.6 support the hypotheses in Figure 5.2 for the cognitively intact clients. Case managers would recommend home care for all cases except the high risk case that is willing to consider relocation. For cognitively disabled clients, however, a different picture emerges. Consistent with the hypothesis and findings that less weight is placed on the preferences of cognitively disabled and high risk clients, case managers will recommend out-of-home placements for all such clients. For low risk clients, case managers will support their preference not to relocate, however the client who is at low risk but willing to consider relocation will have a recommendation for an out-of-home placement. This should be interpreted as the case manager pursuing the best interest of the client, rather than following a positive preference. As noted above, clients were not described as *wanting* to move to a nursing home, only as being willing to consider it. Also, the mean recommendation for a client who does not want any services was an out-of-home placement. Hence, case managers must consider an out-of-home placement appropriate for confused clients. Preferences for in-home care (be it family or formal) have a modest protective effect, however it is outweighed by the effect of increased physical disability. (The term 'outweighed' is used on purpose because, as noted above, the odds ratios are pretty much the same for low risk and high risk cognitively disabled clients.)

The second part of this analysis is to consider the effect of combinations of client preferences on case managers' recommendations. Based on the finding that preferences matter more for cognitively intact clients, the following analysis will be solely based on those sub-groups. Figure 5.3 shows the expected recommendations for several specific situations. The first row reflects the hypothesis that if clients are willing to have any type of service, case managers will respond by recommending what they believe is necessary. In the low risk case,

this means the case manager would be reluctant to intervene at all, and if she did she would recommend home care. In the high risk case the case manager would recommend an intervention, and it is expected she would recommend an out-of-home placement.

The second row represents a typical constellation of client preferences. The expected outcomes are similar to the first row except for the starred cell. If case managers respect client preferences not to relocate to a nursing home, then they will recommend home care. Based on the findings above that the importance of client preferences is attenuated in the presence of high risk, this effect is expected to be marginal.

The third row represents a client who is unwilling to have any help at home, but will consider relocating to a nursing home. (This is the same case as presented in row 3 of Figure 5.2.) With regard to the decision to intervene versus continue monitoring, in the low risk case, case managers should respect the client's preferences not to have any services. And in the high risk, case, the case manager will intervene (because the client is not against all possible interventions). With regard to the decision to recommend an out-of-home placement versus home care, case managers will recommend an out-of-home placement for the high risk case. However, it is not clear what case managers will do in the low risk case. A recommendation for an in-home care plan would run counter to the client's preferences, but a nursing home is not necessarily the appropriate service for a client with IADL limitations only.

Finally, the fourth row shows the expected recommendations for a client who does not want any services at all. (This is the same as the reference case that has been used throughout this dissertation.) It is expected that case managers will be reluctant to intervene at all for such a client. For the subgroup who have some intervention, it is not clear what will do: both options over-ride client preferences. The results will suggest, therefore, which preference is considered more important in this situation. (I.e., If case managers recommend an out-of-home placement it can be concluded that preferences for not having home care out-weigh preferences for not relocating, and vice versa.)

The client described in the first row will be considered the baseline case for the following. This baseline is what we would observe if the client was compliant and the case managers followed a best interest, or agency approach. The high risk clients described in the second and fourth rows provide clear examples of where attention to preferences should lead to different recommendations. In the second row, as noted above, attention to preferences should lead to a recommendation for home care. In the fourth row, attention to preferences should lead to a recommendation to continue monitoring and not intervene.

The predicted probability of an out-of-home placement for the baseline case was .37. The probability of an out-of-home placement for the high risk client in row two was .24. Comparing these two cases, several things must be noted. First, although it was expected that in the baseline case the recommendation would be for an out-of-home placement, the actual probability was less than .50, implying that the recommendation would be for an in-home care plan. Nevertheless, this was one and a half times higher than the probability of an out-of-home placement recommendation for the client in row two who does not want to consider relocation at all, but is willing to have in-home care. The conclusion is that case managers are indeed responsive to client preferences.¹⁰

The situation posed in row four presents a different story. The probability of an intervention versus continued monitoring in the baseline case is .99.¹¹ In row four, the probability is .83. The predicted recommendation in both cases is an intervention. However, in the case of

¹⁰The predicted probabilities presented in this and the following paragraph were calculated by running separate regressions on the subgroups of interest. This was done to determine if there was a 3-way interaction between preferences. Comparison of these probabilities with probabilities calculated based on regressions presented on Table 5.5 and Table 5.6 revealed that there were no differences larger than one one hundredth. It can be concluded that while there are important 3-way interactions between physical function, cognitive function and preferences, there are no 5-way interactions. It must be noted that the sample sizes were quite small for these comparisons, hence it is possible that interactions may have gone undetected.

¹¹Calculated based on results from regression on high risk, cognitively intact clients (i.e., Table 5.5).

the client who is unwilling to have any services at all, this probability is about 16% smaller. The implication is that case managers are responsive to client preferences, but not enough to make a difference.

5.2 Effect of Case Manager Variables

5.2.1 All Case Managers Use The Same Decision Making Process ($H_{2.0}$)

To test the hypothesis that case managers use the same decision making process, in each model, every case manager was allowed to have a unique value for the intercept and the slope on the three client preference variables. Each intercept and slope parameter was thus treated as an unobserved, random variable that was estimated from the data rather than measured as part of the survey. The variance of each parameter was computed; if the variance was zero then it was concluded that all case managers have the same value for that parameter. However, if the variance was statistically different than zero, it was concluded that there were unobserved (unmeasured) differences between individual case managers, implying that case managers used different decision making processes.

Table 5.8 summarizes the variance terms that were significant at the $p < .01$ level. In most models, it was found that random intercepts and slopes were necessary to account for differences between individual case managers.¹² This provides substantial evidence that individual case managers have different decision making processes, supporting both hypothesis $H_{2.1}$ and $H_{2.2}$. Note that the variances summarized on Table 5.8 are from initial models with client variables only. In the models with all relevant explanatory variables (ie client, case manager, agency and state), these variances did not change, supporting the conclusion that these are random effects.

¹²As noted in Chapters 3 and 4, different estimation procedures were used for each model. Because the different estimation procedures are downwardly biased to different degrees, it is not possible to compare the magnitude of the variances between models, hence Table 5.8 shows a check mark for the significant variance components rather than the actual estimate.

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After estimating each model, it was possible to calculate each individual case managers' intercept and slope. These results were then used along with the estimates of the effects of the client variables to demonstrate how unmeasured differences between individuals can affect decisions. Consider the decision to recommend an out-of-home placement for a given set of client characteristics. Figure 5.4 shows the probability of an out of home placement recommendation for case managers with different intercepts. The 10th, 25th, 50th, 75th, and 90th percentiles of the distribution of case manager intercepts were used. All clients were described as being limited in three ADLs, older, and not willing to have any paid home care, family care or to relocate. The median case manager had a probability of recommending an out of home placement of only .16, however the top 10% had a probability of .54 (see also Table 5.9, Row 1).

Table 5.9 shows the effect of individual differences in slopes on case managers recommendations. Since the slopes and intercept covaried (see Table 4.27), the median of each slope was calculated for all cases that fell within the 95% confidence interval of each percentile of the intercept (see Appendix F, Table 1). In general, while clients who were willing to have paid home care or family care were less likely to have a recommendation for an out-of-home placement, the top 10% were 43 times as likely to make such a recommendation as the bottom 10%. For equivalently disabled clients who are willing to relocate there is a wide range of possible outcomes depending on which case manager handles the case.

5.2.2 Differences between individual case managers (in either intercepts or coefficients or both) are associated with measurable characteristics of the individual ($H_{2.3}$)

Variables that describe case managers were used to explain between-individual variation in the intercept and slope terms in each model. For each of the five models there was one intercept and three slopes. In two of the models, however, there was no variation in the slope on client preferences for family care, so case manager variables were not used. Case manager variables were thus used in the equivalent of 18 regression equations; each represented as a

column on Table 5.10. Before considering the individual results, it is important to note that there were a total of 252 coefficients that may have been statistically significant. Using the standard requirement that the probability of incorrectly rejecting the null hypothesis must be lower than .01, by chance alone about three (3) coefficients would be expected to be significant. There were 17 significant findings overall, suggesting that the statistical inferences do not overly capitalize on chance. Nevertheless, due to the conceptual similarity of the different runs, instability and differences between the different the estimation procedures, a conservative approach will be taken to interpreting these findings. Specifically, only variables that have an effect in two or more runs are considered meaningful. Coefficients that show up as significant in only one regression model may be artifacts of the estimation procedure rather than true findings.

There were few consistent patterns of findings across the different models. Of the 14 variables, only two had significant findings in more than one model. In general, the case manager variables did not explain case managers' recommendations. The first variable to have a systematic effect was whether the case manager specialized in intake tasks, ongoing case management, or performed all case management tasks. Case managers who specialized in intake were more likely to recommend an out-of-home placement compared to home care, and more likely to recommend a nursing home placement compared to home care, controlling for client variables (Table 5.10; see columns labeled 'intercept').

Intake case managers also consistently placed lower weight on client preferences. Intake case managers had lower values on the slopes on client preferences for paid home care in the decision to recommend an out-of-home placement and in the decision to recommend a group home or nursing home compared to home care. They also placed lower values on the slopes on client preferences for family care in the decision to recommend a group home versus home care.

Care must be taken to properly take into account the main effects when interpreting these findings about slopes. To calculate the probability that an intake worker would recommend

an out-of-home placement for a particular client, it is necessary to combine the effects of the client characteristics and the effect of being an intake worker. As an example, consider the effects of an being intake worker in the context of client preferences for having formal home care providers.¹³ Table 5.11 shows the predicted probability that the average case manager in the average agency will recommend an out-of-home placement for a client who is limited in three ADLs, between 75 and 85 years old, confused and has weekly visits from an adult daughter. If this client is willing to have paid providers ($\beta = -1.774$), there is no difference between intake case managers and case managers who do all tasks or ongoing tasks. Both are less likely to recommend an out-of-home placement ($p_{\text{ooh}} = .08$) than home care ($p_{\text{hc}} = \{1 - p_{\text{ooh}}\} = .92$). However, if the client is not willing to have paid providers, different conclusions may be reached by different types of case managers. Specifically, case managers who do all tasks or ongoing tasks are more likely to recommend home care ($p_{\text{hc}} = .65$) than an out-of-home placement whereas an intake worker would be more likely to recommend an out-of-home placement ($p_{\text{ooh}} = .54$).

The same pattern of results is evident in the model that separates the type of out-of-home placement into group home and nursing home. As shown on Figure 4.6, the effect of being an intake worker increases the odds that *any* client, regardless of preferences, will have a group home or a nursing home placement recommendation versus a plan for in-home care as compared to an ongoing case manager or a case manager who does all tasks.

One other case manager variable had a consistent effect. Case managers with more new cases in the previous full month had slightly higher values for the slope on client preferences for family care in both the decision to recommend an out-of-home placement and the decision to recommend a group home. Figure 5.5 shows the effect of increasing the number

¹³The effect of the agency level variable 'separate intake and ongoing staff' was not significant in the model that predicts home care v. out-of-home placement. Also, the coefficient on 'ongoing' was not statistically significant, implying that ongoing workers are not different from the reference category -- case managers who do all tasks.

of new cases on the probability of the case manager will recommend an out-of-home placement for a given set of client characteristics.¹⁴ Note that there is no direct effect of the number of new cases on the outcome, only an interaction with client preferences. Case managers are less likely to recommend an out-of-home placement for clients who are willing to have family and have some family available than for clients who are unwilling and have no family available. However, as the number of new cases increases case managers are less likely to recommend an in-home care plan and more likely to recommend an out-of-home placement. In other words, as their workload increases (as measured by the number of new cases) they place less value on client preferences. When the number of new cases rises above 32, case managers are more likely to recommend an out-of-home placement than in-home care for the same client. While this number is above the average number of new cases reported by case managers (6.9; see Table 4.5), it is within the observed range (0 to 60).

As noted above, the majority of case manager variables were not statistically significant. Thus, bulk of the hypotheses about specific variables presented in Chapter 3 were not supported. It was anticipated that social workers and nurses would differ from case managers with no professional education, training or licensure. Nurses were expected to be more likely and social workers were expected to be less likely to intervene or recommend an out-of-home placement or a nursing home placement than non-professionals. In general, however, nurses and social workers were not different from non-professionals. The hypothesis that nurses would be more likely to recommend a nursing home placement compared to home care is supported, however there was no effect in the nested model on the odds of recommending an out-of-home placement in general. Social workers were more likely to recommend a nursing home than non-professionals, contrary to expectation. A tentative explanation is that professional education or training may increase case managers' sense of responsibility, and thus lead them to recommend

¹⁴Client is described as having limitation in three ADLs, confusion, and between 75 and 85 years old. The client who is 'unwilling' to have family help does not have any. The client who is willing to have family help has a daughter who visits weekly.

nursing home placements to protect client safety. Fear of liability, which is attendant on professional certification, may affect this as well.

Educational level (bachelors and masters degrees) was hypothesized to reduce the likelihood of an out-of-home placement of both types and increase the weight placed on client preferences. There was no effect of education in any of the equations, except in the slope on client preferences for paid home care in the decision to recommend a nursing home. While this finding was in the expected direction, the failure of education to have a systematic effect in the related specification of an out-of-home placement casts doubt on the stability of this results.

No directional hypotheses were advanced for case manager gender, and none were observed.

Specialization in intake tasks was hypothesized to lead to a greater rate of out-of-home placement and lower weight on client preferences. Case managers who specialize in ongoing tasks were hypothesized not to differ from those who do all tasks. These two hypotheses were generally supported by the data. Intake case managers were systematically more likely to recommend an out-of-home placement as well as a nursing home placement. And they placed lower weight on client preferences for formal and family care. Ongoing workers did not differ from the reference category except in one equation that predicted their slopes on family care. (The statistical power to detect 'no association' is weaker than the power to detect an association, hence this result must be interpreted cautiously.)

Case managers who work with multiple other client populations besides the elderly were expected to be more likely to recommend an out-of-home placement and to place lower weight on client preferences. There was generally no effect of this variable, suggesting that case managers who handle different types of clients make decisions for elderly clients similarly to their peers. The finding that they have a lower slope on client preferences for relocation in the decision to recommend a group home versus a nursing home suggests that they interpret preferences somewhat differently than their peers (this was the only case managers variable

significant in this decision), which may be related to differential experience with group home settings for other populations. (The direction of this slope makes them more like case managers from a state with substantial supply of group homes; see Section 5.4.)

As hypothesized, case managers who provide more direct care are more likely to intervene in a client's case. However they do not differ in the decision to recommend an out-of-home placement, or the type of out-of-home placement.

It was hypothesized that case managers who had some training in ethical decision making would be less likely to recommend an out-of-home placement, and would place more weight on client preferences. However, there was no effect of this variable in any of the models.

Experience as a case manager was hypothesized to reduce the likelihood of an out-of-home placement. The results showed no difference for this variable.

The number of new cases was expected to decrease the odds of intervening at all, increase the odds of either type of out-of-home placement, and decrease the weight placed on client preferences. The results showed that although there was no general effect of this variable on the odds of an out-of-home placement, a greater number of new cases was indeed associated with less respect paid to client preferences for having family care.

Finally, caseload size was anticipated to have the same pattern of effects as the number of new cases. This variable did not have any independent effect. It is likely that other variables such as experience, task specialization and the number of new cases accounted for any effect that might have been associated with caseload.

5.2.3 Variation Among Case Managers in the Effect of Preferences for Sub-Groups of Clients

This section will augment the analysis of variation among case managers in the weight individuals place on client preferences by examining specific sub-groups of clients where preferences are expected to be especially relevant. This is in contrast to the analytic approach presented in the previous section which tested the hypothesis that there is variation among case

managers in their intercept and slope terms.

In general, it is hypothesized that in situations where client preferences conflict with case managers' preferred recommendation, there will be greater variation among case managers. Some will make recommendations that would have the effect of supporting client preferences. Others will make recommendations that would have the effect of over-riding client preferences. The presence of variation will be taken as evidence that there is no strong consensus about what to recommend in such situations. It is likely that in such situations, case managers with different background and training will make different recommendations.

Building on the analysis presented in Section 5.1.2, two important cases are considered. The first is the case of a cognitively intact client at high risk who is willing to have family care or formal care, but not relocate to a nursing home (see Figure 5.3, row 2). This client's preference not to consider relocation may be in conflict with the case manager's perception that an out-of-home placement is necessary. It is hypothesized therefore, that in the decision to recommend an out-of-home placement, there will be greater variance for this sub-group than for the baseline sub-group.

The second case is that of a cognitively intact client at high risk who is not willing to have family care, formal care, or consider relocating to a nursing home (see Figure 5.3, row 4). This client's preference not to have any help at all will conflict with the case managers' judgment that some type of intervention is necessary. It is anticipated, therefore, that in the decision to recommend some intervention, there will be greater variance for this sub-group than for the baseline sub-group.

The baseline sub-group for this analysis is the high risk client described in row 1 of Figure 5.3. This client type was chosen for the baseline because it is expected that consensus among case managers should be strongest for the case where risk is clear and the client is described as acquiescent to any possible care plan.

Table 5.7 shows the variance among case managers for the baseline and two sub-

groups described above. The variation in the baseline case for the decision to recommend an out-of-home placement was 1.6. As anticipated, in the context of conflict between risk and preferences, there was greater variation among case managers: 1.94; an increase of 20%. In the second case, the variation was twice that in the baseline case: 3.2.¹⁵

Next, the case manager variables were added to the regression to determine if certain characteristics were associated with higher or lower individual probability of recommending an intervention or an out-of-home placement. Even though there was significant variation among case managers in each of the sub-groups, it was not possible to estimate the models following this approach. This was because the sub-group approach segregates the data into arbitrarily small sections, some as small as 189 cases. Even though these are true samples across the case managers in the study, there are not enough observations per case manager to estimate the model. As noted in Chapter 3, multiple observations of each case manager are needed to estimate the relationships between case manager variables and the dependent variable or slopes.

5.3 Effects of Agency Variables

5.3.1 Averaging across case managers in the same agency, each agency has an idiosyncratic average threshold for reaching decisions (ie different intercepts) ($H_{2.4}$)

In each of the five models, the presence of agency-specific intercepts was measured by estimating the variation that could be attributed to the agency level of the hierarchy. Table 5.12 summarizes these findings; all were significant at $p < .01$ except as noted. There was variation between agencies in each of the intercept terms except the decision to intervene. However, it is important to note that in the final models which included all relevant explanatory variables (e.g. client, case manager, agency and state), the agency level variances were, in general, no longer significant. This does not rule out the possibility that agency variables may affect case

¹⁵ It is arguable that the variation in the baseline case should have been evaluated for the other decision. However, it was not possible to estimate this model due to small sample size and unbalanced marginal ($n=189$; only 5 cases had a recommendation for in-home care).

managers' decisions, because non-random variation between agencies might still exist.¹⁶

5.3.2 Differences between agencies' average thresholds are associated with measurable features of the agencies. (H_{2g})

Variables that describe case management agencies were introduced into the models to determine if they had any effect on case managers' decisions. The effects of agency variables are summarized on Table 5.13; only effects significant at the $p < .01$ level are shown. Agencies that function on a strict brokerage model were not different from agencies that have some purchase authority, with the exception that they were more likely to recommend a nursing home compared to a group home. It was hypothesized (Table 3.7) that agencies that provide some services would be more likely to intervene and be more likely to recommend a group home (where they might earn revenue by delivering care) rather than a nursing home placement. The results show that provider agencies were more likely to intervene and more likely to recommend an out-of-home placement, but more likely to recommend a nursing home (i.e. no effect in group home equation) compared to home care. A conclusion drawn from this pattern of results is that case managers who work at brokerage or provider agencies, compared to free-standing case management with some purchase authority, are less comfortable maintaining very disabled clients at home with home care, and in general prefer nursing home placements.

The amount of money available for client care was hypothesized to be positively associated with an increased likelihood of an out-of-home placement of both types. The results showed no effect controlling for all other variables.

¹⁶The distinction between random and non-random variation is analogous to the difference between random and fixed effects. The hypothesis tested by the presence of variation in the intercept specifically tests for random variation; the presence of a fixed effect is tested by examining the coefficient on each regressor. Recall that in the section on case manager effects, when there was no random variation in the slope on client preferences for family care in two equations, case manager variables were not entered into these 'sub' equations (i.e., interacted with the slope on client preferences for family care). However, the overall (fixed) effect of each case manager variable was included and tested in each equation.

No directional hypothesis was advanced for agencies that used separate staff for intake and assessment. The results show that staff from agencies with separation of tasks were less likely to intervene at all, and less likely to recommend a nursing home placement compared to home care. However, this finding must be interpreted by examining the effect of the individual case manager variable, as demonstrated elsewhere. The fact that there is a significant agency effect as well as an individual effect suggests that there is something about the organizational context in which tasks are separated that affects case managers above and beyond differences in the individual duties of intake and ongoing staff.

The requirement of supervisory approval over assessments and care plans was hypothesized to have an effect on the amount of variation in case managers' out-of-home placement decisions. These hypotheses were not tested because there was not significant variation in the intercept at the agency level, hence it was impossible to compare the relevant subgroups. Supervisory approval over care plans was observed to decrease the odds of a nursing home placement compared to a group home and compared to home care, contrary to the hypotheses. One explanation is that supervisory oversight of care plans leads to more suggestions from senior staff on how to develop better care plans. Also, case managers in such agencies may be more comfortable maintaining high risk clients at home because they know their supervisors are aware of their decisions.

The effect of more frequent client contact, in terms of monitoring and home visits, was hypothesized to reduce the likelihood of an out-of-home placement of both types. The results show that more frequent monitoring is associated with a 3% increase per contact per year in the odds of a nursing home placement, contrary to expectation. Perhaps case managers who are required to monitor more frequently have less time available for difficult cases (or any cases) and recommend nursing home placement to reduce their workload. Another explanation may be that case managers who have more frequent client contact are more familiar with the risks that clients face and hence more proactive in reducing those risks.

It was originally hypothesized that the ratio of supervisors to staff would affect the variation. This was not tested for the same reasons given above with respect to supervisory approval. This variable had no direct effect on case manager's recommendations; neither did the average caseload size or the number of case managers (a proxy for size of agency).

5.4 Effects of State Dummy Variables

The effects of state dummy variables are presented separately because they cannot be easily interpreted. There are far too many possible explanatory variables that might cause differences in case manager behavior than are possible to include in a plausible multiple regression analysis. This is true in general for state level health services research, and has limited previous research in case management. The standard practice of including a dummy variable allows the presence of differences to be detected, but does not always enable interpretation.

In the present study, states with different approaches to case management were selected. The goal was to maximize the potential for observing differences. What is striking is that for the most part there were few state effects. With one major exception, there was no clear pattern to the findings. The one exception was in the decision to recommend a group home versus a nursing home, given that some type of out-of-home placement was recommended.

It was hypothesized that in states where case managers are allowed to authorize in-home services for clients in residential settings, the odds of a nursing home placement compared to group homes would be lower. Having authority to support clients in alternative living settings was expected to make case managers more likely to use this option in the study. As noted on Table 2.2, this includes Colorado, Connecticut, Florida, Georgia, Minnesota and Washington. California was the reference category. The results show that the odds of recommending a group home versus a nursing home in Colorado, Florida, Georgia, Minnesota and Wisconsin were not significantly different from the odds in California. The odds in

Washington were slightly lower than in California. No clear pattern emerged. While most of these states allowed services in alternative settings, California and Wisconsin did not, and Connecticut did. The results show that case managers from Connecticut were much more likely to recommend a nursing home. Being able to authorize services in an alternative setting does not seem to have a clear effect.

To help explain this pattern, differences in the actual supply of alternative living settings were examined. Table 2 of Appendix F shows the number of board and care and nursing home beds per 1000 persons over 65 in 1994. The last column shows the ratio of nursing home beds to board and care beds; a high number indicates that the state has more nursing home beds per 1000 elderly. Table 5.15 compares this ratio to the results on Table 5.14. It is apparent that the states with the top four ratios (CT, MA, IN, OH, in descending order) are the same four that have statistically significant coefficients in the direction of favoring nursing home placement (CT, IN, OH, MA). Furthermore, the relative sizes and the rank order of the ratios and coefficients are similar with the exception of Massachusetts, which has the second highest ratio but the fourth largest coefficient. The states with no effect in the analysis all have ratios between 1 and 3. Washington, which has a negative coefficient and the third lowest ratio, is noted for its policy of developing alternatives settings (GAO, 1994).

The conclusion that may be drawn from this finding is that case managers do appear to be affected by their environment in predictable ways. It is not surprising that the policy information that describes the alternative settings where waiver services may be provided did not seem to be associated with case managers' care plan recommendations. The existence of a policy does not provide any information about how case managers perceive the services and settings available for clients. A better variable would be the number of clients living in alternative residential settings and receiving waiver services. However, such data are not available.

Figure 5.1 Relative Weight Placed on Client Preferences for Combinations of Physical and Cognitive Disability

Cognitive Status	Physical Disability	
	Low Risk	High Risk
Intact	1	2
Disabled	3	4

1 = strongest, 4 = weakest

Figure 5.2 Expected Directional Effects of Client Preferences and Predicted Recommendations for Key Decisions

Preference Statement: Willing to:	Intervene (+) v. Continue Monitoring (-)				Out-of-Home Placement (+) v. Home Care (-)			
	Low Risk		High Risk		Low Risk		High Risk	
Have Family Care	-	Monitor	-	Intervene	-	Home Care	-	Home Care
Have Formal Care	+	Intervene	+	Intervene	-	Home Care	-	Home Care
Consider Relocation to a Nursing Home	+	Intervene	+	Intervene	+	Home Care	+	Out-of-Home Placement

Figure 5.3 Expected Recommendations for Combinations of Client Preferences in Key Decisions^a

Preference Profile (Willing to):				Decision	
Have Family Care	Have Formal Care	Consider Relocation to a nursing home	Risk	Intervene v. Continue Monitoring	Home Care v. Out-of-Home Placement
1. Yes	Yes	Yes	Low	Monitor	Home Care
			High	Intervene	Out-of-Home Placement
2. Yes	Yes	No	Low	Monitor	Home Care
			High	Intervene	Home Care (*)
3. No	No	Yes	Low	Monitor	?
			High	Intervene	Out-of-Home Placement
4. No	No	No	Low	Monitor	?
			High	Monitor (*)	?

^a All clients are cognitively intact.

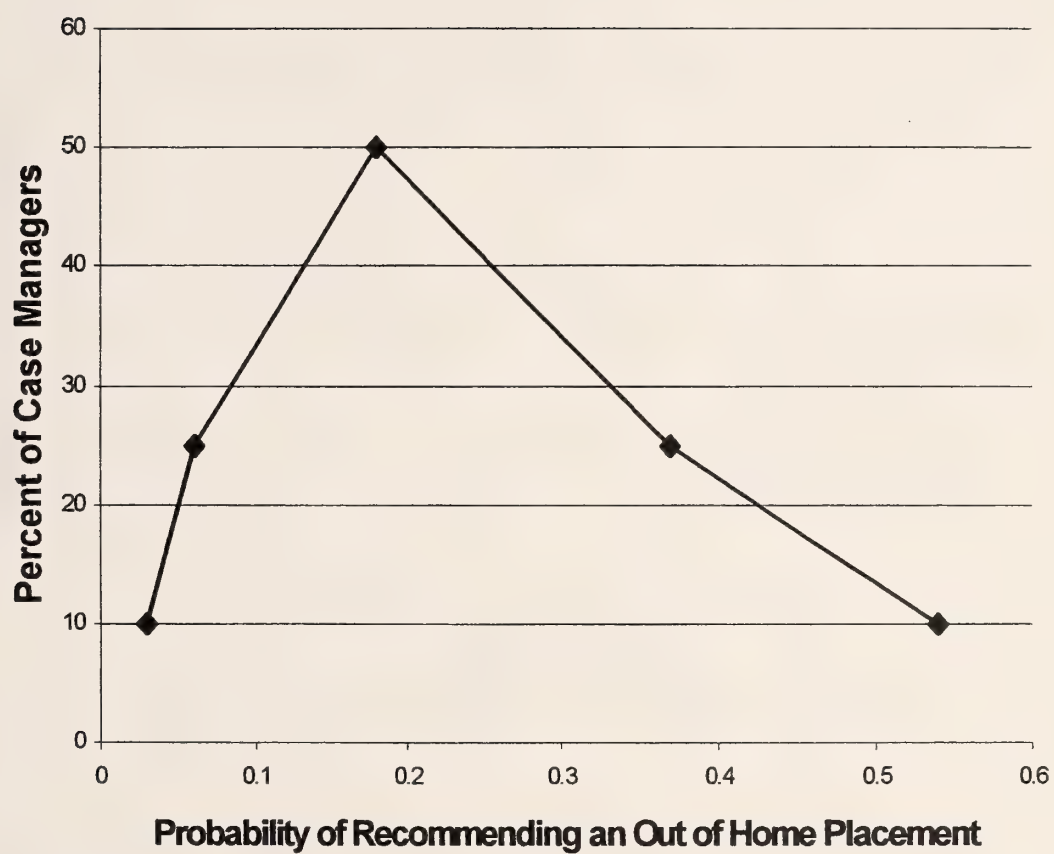
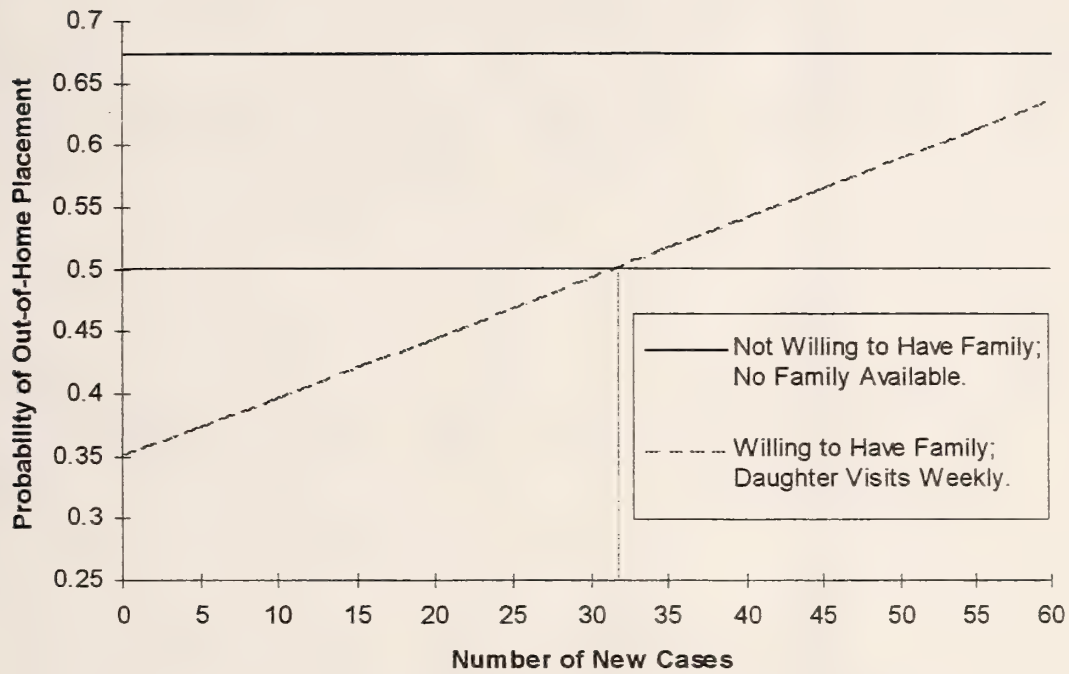


Figure 5.4 Distribution of Case Managers' Recommendations Based on Variation in Intercepts



Note: Both lines reflect clients with 3 ADLs, confusion, and between 75 and 85 years old.

Figure 5.5 Effect of Number of New Cases on Probability of Out-of-Home Placement

Table 5.1 Summary of Effects of Client Variables (Significant Odds Ratios)

	Decision to Intervene	Nested Model		Non-Nested (MNL Model)	
		Out of Home v. Home Care	Nursing Home v. Group Home	Group Home v. Home Care	Nursing Home v. Home Care
Intercept		.03	.003	.12	.01
Physical Function (3 ADLs)	3.67	4.9	19.2	1.62	7.63
Age (> 85)	1.44	1.25	1.41		1.31
Cognitive Function (Confused)	3.07	11.1	4.8	4.2	7.39
Health (CHF)	.75				
Preferences: (Willing)					
Have family help		.48		.64	.68
Have formal providers	13.29	.17		.31	.32
Relocate		3.93	4.62	1.8	2.95
Informal Support (Daughter visits)					
Weekly	.76	.54	.68	.69	.57
Daily	.28	.33	.6	.51	.39
Agency Budget (\$500)		.79		.87	.76
Client Contributes					
\$50		.88			.87
\$100		.77		.85	.8

Reference categories are: IADL Only, Age < 85, Not Confused, Diabetes, Not Willing, No Informal Support, Agency Budget \$300, and \$0 Client Contribution.

Table 5.2 Effect of Increasing Risk Factors on Each Dependent Variable

Client Characteristics: \$300 agency budget, no client contribution, no family care, and not willing to have family care, paid home care or consider relocating to a nursing home.

Risk Factors:	Intervene v. Continue Monitoring	Non-Nested Model		Nested Model	
		Out of Home v. Home Care	Nursing Home v. Group Home	Group Home v. Home Care	Nursing Home v. Home Care
IADL Only	.53	.03	.00	.10	.01
3 ADLs	.81	.13	.06	.15	.06
Age (85-95)	.86	.16	.09	.16	.08
Confusion	.95	.67	.31	.33	.29

Table 5.3 Effect of Client Preferences and Cognitive Status on Probability of an Out of Home Placement Recommendation

Client Characteristics: No family care, low agency resources, 3 ADLs, age between 85 and 95, and not willing to consider relocating to a nursing home.

Cognitive Status:	Preference for paid home care:	Willing	Willing	Not Willing	Not Willing
	Preference for Family Care:	Willing	Not Willing	Willing	Not Willing
Not Confused		.02	.03	.08	.16
Confused		.15	.26	.50	.67

Table 5.4 Probability of an Out of Home Placement Recommendation For Combinations of Client Preferences and Availability of Family Care in the Context of High Risk and Low Resources

Client Characteristics: 3 ADLs, Confusion, low agency budget, older, not willing to have formal home care or consider relocation to a nursing home.

Preference for Family Help:	Availability of Family		
	None available	Weekly visits	Daily visits
Not Willing	.67	.53	.41
Willing	.50	.35	.25

Table 5.5 Effects of Client Preferences on Decision to Intervene versus Continue Monitoring for Sub-Groups of Clients

Parameter	Low Risk ^a			High Risk ^b		
	Odds Ratio		Predicted Probability	Odds Ratio		Predicted Probability
Cognitively Intact	(n = 1558)			(n = 1501)		
Intercept	1.73	**	.63	5.12	**	.84
Preferences for Family Care	.91		.61	.79		.80
Preferences for Formal	6.51	**	.92	13.4	**	.99
Preferences for Relocation	1.5	**	.72	2.42	**	.93
Cognitively Disabled	(N = 1501)			(N = 1519)		
Intercept	5.4	**	.84	8.25	**	.89
Preferences for Family Care	.95		.84	.77	**	.86
Preferences for Formal	4.24	**	.96	7.23	**	.98
Preferences for Relocation	1.62	**	.90	2.14	**	.95

^aDefined as having IADL limitation only.^bDefined as having three ADL limitations.

** p < .01

Table 5.6 Effects of Client Preferences on Decision to Recommend an Out-of-Home Placement Versus Home Care for Sub-Groups of Clients

Parameter		Low Risk ^a			High Risk ^b		
		Odds Ratio		Predicted Probability	Odds Ratio		Predicted Probability
Cognitively Intact		(N = 3033)			(N = 3285)		
	Intercept	.14	**	.12	1	**	.50
	Preferences for Family Care	.6	**	.08	.71		.42
	Preferences for Formal	.16	**	.02	.39	**	.28
	Preferences for Relocation	4.44	**	.38	2.75	**	.73
Cognitively Disabled		(N = 3274)			(N = 3437)		
	Intercept	1.17		.54	3.69	**	.79
	Preferences for Family Care	.76	**	.47	.70	**	.72
	Preferences for Formal	.55	**	.39	.58	**	.68
	Preferences for Relocation	1.75	**	.67	1.84	**	.87

^aDefined as having IADL limitation only.^bDefined as having three ADL limitations.

** p < .01

Table 5.7 Variation Among Case Managers in the Effects of Client Preferences for Sub-Groups of Clients

Case:	Preferences (Willing to):			Risk	Variation Among CMs	
	Have Family Care	Have Formal Care	Consider Relocation to a nursing home		Intervene v. Continue Monitoring	Home Care v. Out-of-Home Placement
Baseline	Yes	Yes	Yes	High	*	1.6
Row 2	Yes	Yes	No	High	-	1.935
Row 4	No	No	No	High	3.2	-

* Unable to estimate.

Table 5.8 Summary of Significant Case Manager Level Variance Components

Model	Parameter			
	Intercept	Slope on Client Preference for:		
		Family Care	Paid home care	Relocation
Decision to Intervene	✓		✓	✓ ^a
Home Care v. Out-of-Home	✓	✓	✓	✓
Group Home v. Nursing Home	✓	✓	✓	✓
Group Home v. Home Care	✓	✓	✓	✓
Nursing Home v. Home Care	✓		✓	✓

^a The variance in the case manager-specific estimates of the slope on preference for relocation was not statistically significant, however it covaried with the intercept and the slope on preference for paid home care so was estimated for reasons of parsimony. (See Footnote 1.)

Table 5.9 Effect of Client Preferences and Variation in Individual Case Managers' Intercepts and Slopes on Decision to Recommend an Out-of-Home Placement

<u>Client Characteristics: \$300 agency budget, no client contribution, and no family caregiving.</u>						
Willing to:	Reference CM	Percentile of CM Intercept				
		10	25	50	75	90
(None)	.16	.03	.06	.18	.37	.54
Have paid home care	.08	.01	.03	.09	.24	.43
Have Family Care	.03	.01	.01	.03	.08	.16
Relocate to a NH	.42	.10	.27	.50	.64	.71

Table 5.10 Summary of Effects of Case Manager Characteristics (Significant Odds Ratios)

	Decision to Intervene				Nested Model				Non-Nested (MNL Model)			
	Intercept	Preference for Family Care	Preference for Formal Care	Preference for Relocation	Intercept	Preference for Family Care	Preference for Formal Care	Preference for Relocation	Intercept	Preference for Family Care	Preference for Formal Care	Preference for Relocation
Professional Qualifications:												
Social Work												
Education												
SW License									1.64			
Nurse Training									1.48			
Educational Level:												
Bachelors											1.42	
Masters											1.51	
Gender (Male)												
Task Specialization:												
Intake Only							0.42					
Ongoing Only					2.14				2.65		0.47	
Number of Other												
Client Populations												
Direct Care								0.83				
Ethics Training	1.15											
(Not on Job)												
Years Worked	0.97											
New Cases in Last												
Month							1.02					
Caseload									1.01			

Reference categories: no professional qualifications, no higher education, no task specialization

Table 5.11 Predicted Probability of an Out-Of-Home Placement (p_{ooh}) for Selected Client and Case Manager Characteristics

Client Characteristics: *limitations in three ADLs, confused, between ages of 85 and 95, diabetes, no cash contribution, agency budget of \$300, daughter visits weekly, is willing to have family help, will not consider relocating to a nursing home.*

Case Manager:	Client Preferences:	
	Willing to Have Paid Providers	Not Willing to Have Paid Providers
Ongoing/All Tasks	.08	.35
Intake Only	.08	.54

Table 5.12 Summary of Agency Level Variance Components

Model	Intercept
Decision to Intervene	
Out-of-Home v. Home Care	✓ ^a
Nursing Home v. Group Home	✓
Group Home v. Home Care	✓
Nursing Home v. Home Care	✓

^a Significant at $p < .05$.

Table 5.13 Summary of Effects of Agency Variables (Significant Odds Ratios)

	Decision to Intervene	Nested Model		Non-Nested (MNL Model)	
		Out of Home v. Home Care	Nursing Home v. Group Home	Group Home v. Home Care	Nursing Home v. Home Care
Brokerage Model Only			2.54		
Provide Some Services	1.52	1.4			1.53
Budget (Quartiles)					
Separate Intake and Ongoing Staff	.72				.72
Supervisory Approval:					
Assessments					
Careplans			.43		.61
Frequency of Client Monitoring					
Frequency of Home Visits					1.03
Ratio of Staff to Supervisors					
Average Caseload					
Number of Case Managers					

Reference categories: not strictly brokerage, does not provide any services, no separation of tasks, no supervisory approval, state of California.

Table 5.14 Summary of Effects of State Dummy Variables (Significant Odds Ratios)

	Decision to Intervene	Nested Model		Non-Nested (MNL Model)	
		Out of Home v. Home Care	Nursing Home v. Group Home	Group Home v. Home Care	Nursing Home v. Home Care
Colorado					
Connecticut		5.31	11.99		7.88
Florida					
Georgia	.46				
Indiana			5.92		
Massachusetts		2.34	4.28		
Minnesota				2.01	
Ohio			5.11		2.05
Washington			.113		.42
Wisconsin					

Reference Category is California

Table 5.15 Ratio of Nursing Home Beds to Board & Care Beds and Effect of State on Likelihood of Nursing Home v. Group Home Placement

State	Ratio	Odds Ratio
Connecticut	10.6	11.99 **
Massachusetts	9.8	4.28 **
Indiana	6.2	5.92 **
Ohio	5.2	5.11 **
Minnesota	3.6	.98
Georgia	2.8	1.2
Colorado	2.8	1.3
Wisconsin	2.7	1.1
Washington	1.5	.113 **
Florida	1.2	1.25
California	0.9	- ^a

** Significant at $p < .01$ in model to predict nursing home v. group home.

^a Reference category

CHAPTER 6: DISCUSSION

Community-based long-term care programs financed through Medicaid waivers typically have complex eligibility rules and allocation policies. These rules have been developed to implement state and federal laws intended to increase access to services for certain populations. However, the application of these rules takes place in decentralized networks of local case management agencies that place considerable discretion in the hands of individual case managers. Case managers must interview clients in person and develop customized care plans. This study examined care plan recommendations. Distinct from eligibility determination (i.e. narrow determination of whether a person qualifies financially for the Medicaid waiver), care planning affects who gets services and who does not, how much service, and what kind of services they get. Care planning draws upon notions of appropriateness -- even if a client is eligible for services there may not be an appropriate way to serve her.

Case managers are not simply passive data collectors; they are called upon to use their communication and observational skills to determine clients' functional and cognitive status. They must draw upon their experience, professional judgment and creativity to develop care plans for clients who, among other things, are often reluctant to have any services at all, may deny their own needs, and whose families may be more detrimental than supportive. Austin (1981) and Doty (1995) have pointed out that variation in the experience, skill, and judgment among case managers, as well as differences in program policies, may lead to different care plans for similarly needy individuals.

Previous studies of community based long-term care provided with and without case management have examined the effects of client risk factors, the availability of resources, and the effects of informal (family) care on the type and amount of formal (paid) care, and the likelihood of a nursing home placement, among other outcomes. However, few studies have examined the effects of client preferences on case managers' care plan recommendations (see Vertrees, Manton & Adler, 1989; Phillips, Kemper & Applebaum, 1988). No previous studies

have systematically looked at variation in the weight case managers place on client preferences when making decisions. Finally, the empirical research in case manager decision making is typically limited to single agencies, particular state programs or demonstration projects.

This study was designed to examine case manager decision making with a broad, national sample of case managers and agencies. A straightforward model of case manager decision making was used based on the literature in case management. When making care plan recommendations, case managers are assumed to interpret client characteristics (i.e. variables) in the context of their own experience and personal characteristics and the context of the agency in which they work. By using hypothetical case study methods, case managers' generalized approaches to decision making, rather than the application of specific local rules were the object of study. The two main aims of this study were thus:

Aim 1: What is the effect of client preferences on case managers' care plan recommendations, controlling for the level of risk and amount of available resources?

Aim 2: What is the effect of case manager and case management agency characteristics on case manager's care plan recommendations, controlling for individual client characteristics?

This chapter discusses limitations to the study, the key findings and implications for policy, practice and future research.

6.1 Limitations

In order to help put the results from this study into the proper context, it is important to consider features of the design and implementation that have bearing on the interpretation of the findings. Perhaps the most salient aspect of the study is that the data came from case managers' responses to hypothetical case studies, or vignettes, rather than actual client data. This approach enabled the analysis of care plan recommendations from a very large sample of

case managers from across the country. It would have been prohibitively expensive to collect a comparable sample of actual care plans. Also, such a study would have had to rely on natural variation among cases, whereas in the present study, it was possible to generate cases that represented conceptually interesting variables. For example, information that is not typically recorded by case managers about client preferences could be studied. Finally, the vignettes were randomly assigned to case managers, eliminating the bias due to selection effects that occur in the real world.

The main criticism of the vignette approach, however, is that responses to vignettes, no matter how carefully constructed, may not predict actual behavior in similar situations (i.e. poor predictive validity). This is partly because the vignettes cannot capture all of the sights, sounds and smells of real life that affect behavior (i.e. face or construct validity); but also because the task of making decisions when responding to a survey is qualitatively different from real life decision making. Completing a survey is more like taking a test than real life. Time, the urgency of clients' needs, pressure from families and bosses, and a myriad of other factors that are part of the real world environment do not come into play when taking a test.

The tradeoff is that vignette studies typically have high reliability. By requiring that respondents complete a large number of vignettes, the data are more reliable than if we had only a small number of observations of each case managers' actual care plans. Thus, while case managers' survey responses may not exactly mirror how they would behave in real life, to the extent that the task presented in the survey is an accurate analog for actual care plan decisions, the results are informative and useful. The vignette approach distills what is common across many different case management programs in order to develop a generalized model of decision making. Case managers are asked to apply their professional judgment, abstracted from their own daily experience when responding to the cases.

In order to make the care plan decisions for the vignettes parallel the actual decision making process, the components and response set were carefully constructed. Case managers

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were asked to decide between continued monitoring, developing an in-home, or an out of home placement. As in the real world, information about resources was provided, so the decision to recommend an out-of-home placement would be based in part on whether an appropriate in-home care plan could be developed within the available budget constraint. The survey questionnaire thus included a care plan worksheet that assumed certain prices for an hour of each in-home service, and asked case managers to specify the type and number of visits. The prices per unit of service (drawn from data provided by the American Public Welfare Association) were specified (see survey instrument in Appendix B, section 2.4; homemaker was \$10 an hour, personal care was \$20 an hour, and adult day care \$40 a day) as were the number of care tasks that could be performed in an hour (ie, a homemaker could do one IADL task, and a personal care aide could do one ADL task). The use of fixed prices and productivity levels standardized the dependent variable and the effects of the independent variables across state programs and local areas. It was recognized that the rules and prices chosen would not mirror all respondents' experience and might seem arbitrary to some. The alternative would have been to allow case managers to rely on their own experience and local market conditions. However, this would have added an additional source of variation to case managers' judgement processes, further complicating the analysis. It would have been difficult to infer that different care plan recommendations for the same client vignette were due to differences in case managers' judgments or simply due to different assumed prices or productivity levels. Furthermore, each state program had different definitions of service types, which would make the data non-comparable.

Some respondents drew attention to the fact that the productivity levels were lower and that the prices were higher than in their region. They felt that this unrealistically inflated the cost of a potential in-home care plan. If such a bias existed in the survey, then it would be expected to increase the rate of nursing home placements and decrease the rate of in-home care plans. (There was no cost associated with a nursing home placement, as in the real world.) Since the

group home placement option required services to be purchased on the budget, this option would be chosen less often. Examination of the distribution of the dependent variable, however, reveals that case managers were much more likely to recommend home care than any other option (2.9 times as likely as group home and 3.6 times more likely than nursing home). Even if the descriptions of in-home services biased case managers' responses to some degree, it did not lead to an overwhelming rate of recommendations for out-of-home placements. Future analysis of the types and amounts of in-home care will allow a more detailed assessment of this issue.

Two important issues need to be noted about client preferences, as defined and used in this study. First, preferences were described as either being willing or not to have family care, paid home care or consider relocation. Although being willing and unwilling are opposites, while the first clearly expresses a negative statement, the second does not express a positive one. Describing the client as not willing to have a certain service means that the client does not want it. However, to say that a client is willing to have something is not the same as saying what the client requests, desires, or wants. The preference variables therefore measure the effect of not wanting something compared to a neutral category akin to passive acceptance. The study did not examine case managers' sensitivity to client demands; rather it examined sensitivity to what clients do not want. Finally, it should be noted that this negative preference was not worded strongly. The decision was made not to study the effect of gradations in the strength of client preferences. This would have increased the complexity of the design, potentially requiring more vignettes per case manager.

Second, as noted above, while attention to client preferences is frequently mentioned as a guiding norm for case managers, in practice, few case managers use consistent approaches to learning what is important to their clients. By including a description of client preferences in each vignette, the study potentially provided more information than is available in the real world. If it is true that case managers, in practice, do not know their clients' preferences very well, as

pointed out by (Degenholtz & Kane, 1995), then the decision making process used for the vignettes may not resemble the process used in the real world. The conclusion that case managers take client preferences into account may thus be an artifact of including preferences in the vignettes.

However, to point out that case managers do not systematically assess client values and preferences does not mean that they never take preferences into account when making decisions. Also, while Degenholtz & Kane (1995) show that case managers do not do better than chance in identifying their clients' preferences, they did not study the same type of 'big ticket' issues as the present study. In the real world, case managers learn right away if their clients are not willing to have any of the offered services. Similarly, they find out their clients' preferences for having family help, or relocation as they develop the care plan, and over time, as they build relationships. The vignettes condense this process into a few sentences. And while it may be unusual to have this information presented as a 'block', a client who is reluctant to have strangers in her home, unwilling to consider relocation to a nursing home, and not willing to have family help out is difficult to deal with, but not unrealistic or unusual.

Granting these limitations to the validity of the approach, the use of vignettes in research on professional decision making has an important strength. Because the decision making task was standardized, the variation in responses (after controlling for vignette - client - factors) must be due to variation between individuals. This type of study, therefore enables the researcher to develop inferences about differences between individuals and social groups. To the extent that study participants bring their professional and personal experience and knowledge of state and local practice to the survey, it is filtered through the individual case managers' cognitive process while filling out the questionnaire.

An alternative approach to assessing the effects of organizational factors on individual decision making would be to examine actual outcomes data from a broad sample of agencies. Incentives at the agency, local service environment, and state policy level would be expected to

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have direct impacts on the outcomes. In the present study, however, such agency factors were constrained to having only indirect effects. Case managers were instructed not to apply the rules and policies of their actual agencies to the vignettes, hence agency variables could only affect decisions via case managers' internalization of their workplace rules. Evidence of null effects of agency variables in the present study does not necessarily imply these factors have no effect in the real world, nor was this the goal of the study. Positive findings, however, imply that agency factors shape case managers' decision making. Thus, the vignette approach has an inherent strength for drawing conclusions about the effects of organizations on individual decision making in an abstract, generalized sense.

The next major factor that impinged on the conclusions was the selection of the sample and the response rate. The criteria for the sample selection were developed to maximize the opportunity to detect the effects of the agency and policy environment on case manager decision making. The sample of case managers for present study was developed by selecting state programs that had varied approaches to organizing case management at the local level. Random sampling was used when possible, however in many circumstances it was decided to include all relevant units rather than a sub-sample. The sample of states represents programs with large-scale, older waiver programs for the elderly across the country. To the extent that some states not in the study were different from the study sample in important ways not captured by variables in the present study, these data may not be relevant. Because there is so little research on operational waiver programs, this study provides a unique and important look at this system.

One particular issue was that the local agencies were selected on the basis of their participation in Medicaid waiver programs. To the extent that other long-term care programs use similar approaches to case management, these data will be highly relevant. Furthermore, to the extent that other long-term care programs use the same network of agencies as those identified for this study, these results will be very informative. Because recommendations about nursing

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home placement were central to the design of this study, programs that are less involved with this issue may find these data less important.

The sample of case managers was selected to be representative of people working for agencies that authorize Medicaid waiver services. Random sampling was used, although to meet minimum sample size requirements, in many local agencies the entire staff was selected. Although more than 50% is a good response rate for a mailed questionnaire, especially one with such a high respondent burden, legitimate criticism may be raised about the potential for bias. In particular, if case managers who did not respond were more likely to be intake workers, for example, then the effects of that variable in the study would be biased (Kennedy, 1992). For this reason a secondary study of non-respondents was launched (see Appendix D). The results of that study, which reached 80% of those surveyed, showed that non-respondents were not significantly different from respondents on any of the variables measured. None of the variables found to be significant in the main study were over or under-represented in the sample compared to the secondary study. It can therefore be concluded that low response rate did not cause the sample to be biased.

The third major limitation has to do with the estimation methods used. As noted in Chapter 3, it was not possible to use measures of variance explained (e.g. R^2) or likelihood ratios to draw conclusions about the importance of variables. Hence, conclusions about the relative importance (e.g. variance explained) of client, case manager and agency effects cannot easily be drawn. Such comparisons could only be based on the statistical significance and magnitude of individual variables. While it was clear that all of the client variables were significant and few of the case manager and agency variables were significant, it was not possible to quantify this conclusion as is typically done when using OLS. Future analysis of continuous data collected as part of the survey but not included in this dissertation will allow the use of R^2 and other measures. These results will be compared to the present findings to assess if different patterns emerge.

A related issue is the sensitivity of the results to the structure of the model and the several different estimation procedures used. For example, decisions had to be made about which slopes were allowed to vary across case managers and agencies. Based on these decisions, a starting point for the structure of each model was chosen. Model fitting then proceeded in an iterative fashion: first estimating the model, then refining the structure by removing variance and covariance terms that were non-significant. It must be noted that since the estimators available were biased toward zero, a biased result could be confounded with a non-significant result. At each step, therefore, the least biased estimation procedure was used. While this should have had no effect on the estimates of the fixed parameters, the estimates of the variances may have been affected by decisions made during the model building process. Because building the models in a different order may have led to different conclusions, the same procedures were used throughout. Finally, variances estimated with different procedures were biased to different degrees and were not comparable.

6.2 Overview of Findings

This study analyzed 814 case managers' responses to 13,844 vignettes that described typical long-term care clients. It is notable that in 12,929 (93%) of the vignettes some intervention was recommended. This highlights the notion that case managers, while generally having their clients' best interests in mind, see even relatively modest care needs as requiring some services. A possible explanation is that this justifies continued case management and 'gets get a foot in the door' in case the client deteriorates. But if case managers authorize services for reasons other than to serve critical client needs, this practice can have dramatic implications for the efficiency of the system and overall costs. Also, provision of care to marginally impaired individuals has the potential to induce dependency and hence inflate future service needs. This finding thus deserves further attention. In particular, it will be fruitful to compare the recommendations observed in this study to actual client data.

Even though the vast majority of client vignettes had a recommendation for some service there was substantial variation among case managers over what services to recommend. For equally disabled clients, different case managers were observed to recommend in-home care plans, group home and nursing home placements. This variation arose both in terms of case managers' mean responses (the intercept) and in the weight they placed on client preferences (the slopes). This raises the question of whether there should be greater standardization of what case managers do, or whether variation reflects a desirable level of creativity and individualization. If more standardization is sought, then at some extreme care plans could be generated by computerized algorithms on the basis of the functional assessment. However, if policy makers believe it is important to take client preferences into account then these results underscore the importance and subjectivity involved when balancing beneficence and autonomy. Case managers appear to use complex, context sensitive decision rules when interpreting client preferences. The finding of considerable variation among individuals suggests that we are far from having a strong consensus on how to achieve the right balance or even where that balance should lie.

Finally, this study examined the influence of workplace factors on case managers's care planning decisions. It was expected that case managers who worked at the same agencies would make decisions more similarly than case managers at other agencies. However, while some agency factors affected case managers recommendations, there was no evidence of any strong agency-specific differences. This highlights the limits of the vignette methodology and suggests areas for further research.

6.3 Implications of findings about effects of client preferences

The effects of client preferences for three common long-term care options on case managers' care plan recommendations were examined in this study. These three options were: (1) to have family members help with care, (2) to have paid home care workers help with their

care, (3) to consider relocating to a nursing home. For the purpose of the study, clients were described as being either 'willing' or 'not willing' with regard to each option. This operationalization deliberately simplified the scope and detail of peoples' preferences for long-term care for the purpose of standardizing the vignettes. People clearly hold more specific preferences than this binary approach implies. Indeed, philosophical analysis (Agich, 1993) and empirical research (Degenholtz & Kane, 1995) have suggested that more specific and nuanced understandings of preferences are needed, and are possible to obtain, for professionals to actually respect the autonomy of their clients. Nevertheless, the goal of this study was to examine the effects of dramatically different preferences on major care plan recommendations. In response to each vignette, case managers could recommend: (1) no services at all (continue monitoring client), (2) home care services, (3) a group home placement or (4) a nursing home placement.

The client preferences described in the vignettes and the recommendations available to case managers were matched in terms of scope and generality. However, client preferences did not exactly match the specific options available to case managers. First, clients were described as either wanting or not wanting family members to help out with their care. But case managers do not typically have the power to arrange for family caregiving (although they may encourage it or try to recruit family or friends). Nevertheless, the availability and quality of family caregiving are important factors in developing care plans. This created conflict between client's preferences and actual situations.

Second, clients preferences were described in terms of willingness to consider relocation to a nursing home, with no corresponding preference about group homes or other residential settings. Alternative residential settings for the elderly such as group homes, adult foster care homes, and assisted living are not as familiar to the general public as are nursing homes. Also, the attributes of assisted living and adult foster care vary from state to state. Some provide home-like environments, others are more institutional. The approach taken in the survey was to

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standardize the group home alternative by emphasizing the features of the setting that make it a distinct from a nursing home. In actual practice, a case manager could explain what a group home was and directly elicit the client's preference. In the survey, however, case managers had to rely on their own judgment about what is appropriate and their willingness to extrapolate from one type of client preference to another.

This study found that, while controlling for client risk factors, availability of resources, case manager and agency characteristics, client preferences had strong and consistent effects on case manager decision making. Case managers were more likely to recommend home care services for clients who are willing to have it, and less likely to recommend home care for clients who are not willing to have it. Similarly, case managers were less likely to recommend relocation to a nursing home for clients who did not want to consider that option. Clients who were willing to have family care were less likely to have a recommendation for a nursing home placement (particularly an unwanted nursing home placement). Finally, case managers were equivocal in situations where there was conflict between a clients' preferences for and actual receipt of family care.

The literature on case management, both descriptive and normative, suggests that case managers, similar to other health care professionals, balance respect for client preferences with other factors. Recently published guidelines for case management (Geron, 1994) foreground the importance of client values and preferences by placing the chapter on consumer rights, preferences and values first, before all other components of case management. The author also foregrounds the balancing act by stating that respect for preferences take place "within the context of payer requirements" (Geron, 1994; p. 24). Qualitative research by Clemens et al. (1994) described situations in which case managers determined that risks to client health and safety outweighed respect for their preferences. The authors suggested that an ethic of respect for client preferences may be more difficult to maintain when available resources are inadequate to support a client at home with paid home care. Hennessy (1989) observed similar decisions

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being made for clients served by a consolidated acute and long-term health care program.

Clients whose care needs seemed to place excessive demands on the budget were less likely to have their preferences followed.

The results of the present study provide some evidence of where the balance shifts from following client preferences to countermanding them. A clear example arose with the decision to recommend an out-of-home placement rather than home care, given that some intervention will be made. For cognitively intact clients who were not willing to have any family members help out, have paid providers, or consider relocation to a nursing home, the predicted probability of an out-of-home placement was .16 (see Table 5.3). Even though this type of client was not very likely to have any intervention at all (.08), case managers appeared to over-ride their preference not to have home care. However, for a similarly disabled client who was also cognitively disabled, case managers appeared to override their preference not to relocate to a nursing home (.67). The conclusion is that while preferences matter, the weight placed on cognitive disability overwhelms the weight placed on preferences not to relocate.

This analysis of the effects of client preferences on decision making explicitly assumed that preferences mattered the same amount for all clients, regardless of physical or cognitive disability. However, it is reasonable to consider relaxing this assumption. Section 5.1.2 pursued this approach by identifying relevant sub-groups of the data based on levels of cognitive and physical disability. The findings showed that case managers discount client preferences in the presence of physical and cognitive disability. That is, less weight is placed on preferences when the client is either physically disabled, cognitively disabled, or both.

This finding, while anticipated by previous research in case management (see Hennessy 1989; Clemens, et al., 1994) runs counter to normative ethics and may be detrimental, rather than protective of client health and safety. Collopy (1990) distinguishes between executorial autonomy, the power to actually carry out ones' wishes, and decisional autonomy, the power to decide what one wants. As a person loses executorial autonomy due to progressive

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disablement, they are at risk of losing decisional autonomy as well. Respect for autonomy thus entails respecting decisional autonomy. Similarly, Heckhausen and Schulz (1995) point out that people have two control processes related to autonomy: the ability to affect the environment, and the power to choose which abilities to develop or use. As the first process diminishes due to disablement, the importance of the second increases. Also, they show that failure to compensate by using the second process can lead to negative sequelae such as depression and poor health.

There are thus two important conclusions that may be made. First, respect for autonomy is a widely accepted social norm that is valuable in its own right. This dissertation has shown where other socially important values, such as protection of life and health come into conflict and perhaps outweigh respect for individual autonomy. The Federal Government and the States, by using decentralized case management systems to allocate and authorize long-term care for vulnerable, disabled adults, reveal a policy preference for how these conflicting values should be reconciled. Reliance on professional judgment has its benefits and drawbacks. The benefit is that each individual clients' situation is reviewed and assessed. The requirement for an individualized plan of care assures that some effort will be made to customize the service arrangements to the individual's need and environment. The chief drawback, as pointed out in this dissertation, is that there is considerable discretion on the part of the individual case managers. Thus, while all clients are unique and need to be treated as individuals, when a broad national sample of case managers responded to a series of similar cases, a range of outcomes were observed. And, importantly, respect for client preferences varied from case manager to case manager.

Second, case managers, it is surmised, recommend services and placements that are intended to reduce risks to client health and safety. However, by undermining the autonomy of their clients, it is possible they are doing more harm than good. This, while workload factors have been shown to potentially undermine the overarching policy goal of cost containment,

differential weight placed on client preferences may undermine public health goals as well.

Chapter 3 introduced the notion that there are underlying dimensions of intrusiveness/autonomy and safety/risk in the available care plan options. To continue monitoring a disabled client and not introduce any services for a client who does not want any help is considered the least intrusive, but also the least safe. Likewise, relocation to a nursing home may offer the highest level of safety for clients who require high levels of care, but this greatly intrudes on and restricts their daily lives and limits personal autonomy. While these two options appear to be at opposite endpoints, it is not clear where options such as home care or a group home placement should fit. Indeed, both are so heterogeneous and broad that it may not even be possible to neatly fit them in. The present study was not designed to develop scales for comparing long-term care arrangements (although this is an important area for future research); however, it does shed some light into how case managers view these different options, in particular group homes and nursing homes.

Two separate empirical models were used to avoid over-reliance on the concept of a clear continuum between monitoring and nursing home placement. The non-nested model provides evidence as to whether case managers extrapolated from client preferences about nursing home placement to group home recommendations. If case managers were willing to extrapolate, then the variable would have the same coefficient in each equation (ie group home and nursing home versus home care). The fully nested model provides evidence about whether case managers consider group homes and nursing homes to be substitutes. If case managers saw group homes and nursing homes as close substitutes then preferences would not matter in recommending one or the other.

The findings suggest that case managers were somewhat reluctant to recommend group homes for clients who indicated that they would be willing to consider relocation to a nursing home. While preference for relocation to a nursing home nearly tripled the odds of a nursing home recommendation, it only doubled the odds of a group home relocation.

The results from the fully nested model show that case managers did not perceive group homes and nursing homes as substitutes. Clients who would be willing to consider relocation to a nursing home were 4.6 times as likely to have a nursing home recommendation as a group home recommendation. Further evidence that these two options were distinct comes from the coefficients on physical and cognitive disability. Being limited in three ADLs is associated with an increase in the odds of a nursing home placement by a factor of 19, and being confused increases the odds of a nursing home placement by 4.8. By contrast, cognitive disability increased the odds of a group home placement by a factor of 11, while physical disability only increased it by a factor of 4.9. The conclusion drawn from this is that different settings appear appropriate (to case managers) for different types of clients.

Finally, the finding that client preferences have effects on case manager decision making is an important development in empirical research in bioethics. By placing preferences into the context of a realistic case vignette, it was possible to quantify these effects in relation to other important factors relevant to case manager decision making. That these effects were strong, consistent across models and in the expected directions lends credence to the overall approach.

6.4 Implications of findings about case manager effects

There were three main findings about the effect case manager characteristics on decision making. First, specialization in intake tasks, as opposed to ongoing tasks or not specializing, was associated with lower weight being placed on client preferences and a higher likelihood of recommending a nursing home placement. Second, higher workload, as measured by the number of new cases in a month, was also associated with lower weight being placed on client preferences and a higher likelihood of recommending a nursing home placement. Third, there were considerable differences among case managers not associated with any characteristics measured by the background survey; for a given set of client

characteristics case managers recommendations could range from in-home care to a nursing home placement.

The finding that the only predictive variables had to do with role-related features of their work is consistent with other research in case management. Austin and Seidl (1981) showed that the differences between a review panel and front line staff were greater than the differences between staff with different professional backgrounds. Abrahams et al. (1989) suggested that organizational differences between the social HMO sites led to different care planning approaches for a set of test cases. Moscovice (1978) found that practice setting rather than level of training had the strongest effect on patterns of care for nurses working in a rural primary care setting. By contrast, Hennessy (1993) found that professional training had an effect on recommendations made by members of a case management team. That study, although similar in design to the present research, examined only a small number of individuals at one work place; thus profession was potentially confounded with individual-specific effects.

Based on the design of the present study, it may have been anticipated that individual case managers' background and training would dominate workplace factors. The survey asked case managers to follow a standardized set of program policies rather than the policies of their actual agencies. Because each individual was asked to draw on her own experience and judgment, differences between nurses and social workers, for example, would have been accentuated. The findings suggest, however, that case managers internalize their day-to-day role related responsibilities to such an extent that it swamped differences due to education or professional training.

These findings have important implications for policy and practice. Over half of the agencies in the sample (52%) had separate staff for intake and ongoing tasks. These agencies tended to be larger, with an average of 12 case managers compared to 7. Data were not collected on the size of the catchment area or the total agency caseload, however it may be safely assumed that agencies with more case managers served larger numbers of clients. If a

primary goal of case managed home and community-based long-term care is to provide in-home services that prevent or delay nursing home placement, closer attention needs to be paid to the influence of organizational structure on decision making. While there was an overall negative effect on nursing home placement associated with all agencies that use separation of tasks (OR .72), after combining the coefficients to find the overall effect, intake case managers were nearly twice as likely to recommend a nursing home placement compared to home care (OR 1.9; see Figure 4.6).

There are four possible explanations for these differences. First, intake workers perform a valuable sorting function for the agency as a whole, eliminating cases that are not appropriate for in-home care. Intake workers often have more experience and higher levels of training than their ongoing counterparts. By relying on the judgment of more knowledgeable case managers, agencies can more accurately target their services to meet program goals. The evidence that intake and ongoing workers have different notions of who is appropriate for home care may thus serve a key policy goal.

The second explanation is that intake workers are overwhelmed and have an incentive to dispose of their cases quickly. Case management agencies must stay within budget constraints for in-home services, however they are not responsible for managing nursing home expenditures. Few state programs provide case management for nursing home residents; once a client moves out of the community they are out of the case load and off the budget. This allows them to avoid 'difficult' cases which may require substantial effort to set up a successful care plan by recommending a nursing home placement. This finding is bolstered by evidence that ongoing case managers with high numbers of new cases are also more likely to recommend an out of home placement (see below). One implication of this finding is that the use of intake workers may keep home care expenditures down but increase overall costs at the state level.

A third factor might be that intake case managers are more risk averse than ongoing case managers. Ongoing case managers get experience with very disabled clients succeeding

at home with home care, even as clients age and deteriorate over time. This may make them more tolerant of risk and more comfortable maintaining clients at home. The experience of intake case managers, on the other hand, is mainly of clients' problems and crises. They work with clients who, for example, have been recently discharged from the hospital, or whose family caregivers have become ill or disabled and can no longer take care of them. Intake workers may be relatively risk averse, and thus more likely to recommend a nursing home placement as a way of providing a higher level of safety and risk reduction.

The fourth possible explanation for the difference between intake and ongoing case managers is that the quality of relationships they share with their clients may have an effect on their willingness to recommend out of home placements. Intake workers have brief relationships with their clients. Clients do not stay on their case loads any longer than necessary. However, ongoing case managers have the opportunity to get to know their clients better. Their relationships are extended over time, often several years. The experience of getting to know their clients as individuals, finding out their clients' preferences, and remaining involved with the case long enough to observe (and even participate in) key decisions may make ongoing case managers relatively more sensitive to client preferences.

It is difficult to develop a research design that might distinguish these competing explanations because the sorting, skimming, and risk aversion hypotheses all seem to go in the same direction. Careful examination of the case mix of and care plan recommendations for clients seen by intake, ongoing and 'all task' case managers would be necessary. Sorting implies that differences between intake and other types of case managers increases efficiency, while skimming implies that it reduces work load but decreases efficiency. (Evidence that caseload does not affect decisions may imply that there is some level of excess capacity.) If there are differences in the case mix, e.g., intake workers see higher risk, more volatile cases than other case managers, this would lend support to the risk aversion hypothesis. Finally, testing the relationship hypothesis could be done by examining the residual of the equation that

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predicts care plan recommendations after controlling for case mix. In other words, if there is a residual effect of being an intake case manager, this would imply that there is some additional factor about the interaction between that type of case manager and the client. A more expensive approach would be to collect data on client preferences.

The second main finding was that as the number of new cases per month increased, case managers were more likely to recommend an out of home placement recommendation for clients who were willing to have family members help out. This was a clear example of how differences in case managers' workload diminished the weight placed on client preferences. Case managers who had fewer than 32 new clients were expected to recommend home care, respecting client preferences not to relocate. However, case managers who had more than 32 new clients were expected to recommend an out of home placement (see Figure 5.2). By contrast, differences in the number of new clients did not affect case managers' recommendations for clients who were not willing to have family help out.

As noted in Chapter 5, the average number of new cases was 6.9, and the range was 0 to 60. Hence, 32 cases, while above the mean, was well within the observed range. Indeed, the average caseload was about 64; adding 32 cases in a month would be an increase of 150%. There are several reasons why a case manager might have an unusually high number of new clients in a particular month. It is possible that the high end of the range reflects dramatic shifts in caseloads due to policy changes rather than ordinary levels of activity. For example, if a case manager resigns then the other staff members must pick up the cases. A change in targeting policies, eligibility criteria, or increased outreach activities may also drive up the number of new cases. For example, a case management agency or state-wide program may take on responsibility for a population that previously did not receive case management or had case management provided by another network of agencies.

The conclusion drawn from this finding is that if a case manager has a high number of new cases in a particular month this can have a dramatic effect on her decision making process.

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Clients who might otherwise receive in-home care will be sent to a nursing home. Preferences will not be respected. And, as the case in Figure 5.2 demonstrates, case managers might even make an out-of-home placement recommendation for clients with a supportive family caregiver. Dramatic program and staffing changes that lead to unusually high levels of intake should therefore be avoided, as this will compromise the overall goals of providing community based long-term care.

It is important to note that caseload per se did not appear to have an effect on decision making. Also, the effect of agency level workload policies regarding the required frequency of client contact which effect the amount of work done per case, were mixed. It is possible that there is simply a difference in intensity between ongoing monitoring and intake type tasks, the former being less onerous. This is consistent with the above findings on the differences between intake and ongoing case managers. In Chapter 3 it was pointed out that intake case managers have more new clients than ongoing case managers. But, even though ongoing workers do not conduct new client assessments or set up initial care plans, they do add new cases. As the number of new cases increases, ongoing case managers start to behave like intake workers. The implication is that the problem is not high levels of activity, but high levels of churning through new cases. More research needs to be done both on measuring workload for different types of case managers and the effect of changes in workload and task specialization on decision making.

The third main finding was that there were significant differences between case managers that were not captured by any of the variables included in the study. These 'unmeasured' case manager factors, as pointed out in Section 5.2.1, were associated with dramatic differences in the recommendations that would be made for the same client by different case managers (see Table 5.9).

Additional analyses were done to identify and try to explain variation among case managers in several sub-groups of clients. This approach supplements the analysis of variation

in the full data set by focusing on cases where greater levels of variation should be observed.

The findings showed that, for sub-groups of cases where there was apparent conflict between client needs and preferences, there was greater variation among case managers. This finding deserves special attention. It makes sense that there should be greater consensus in situations where there is less conflict. When the client appears willing to agree to whatever the case manager recommends, there are no sides to take or issues to debate. In situations of increased conflict, the finding that there is less consensus is therefore not surprising. Case managers could consider a range of interpretations of client preferences and in their actual practice, pursue a variety of strategies for dealing with conflict.

This finding is important from an ethical perspective, because it is not clear what gives rise to differences in case managers' application of ethical principles. This study found that case managers learn about ethics from a wide variety of sources. However, the source of ethics training was not related to any of the outcomes studied. It is possible that case managers have different understandings of the obligation to respect client autonomy, as well as different comfort levels for safety and risk. Descriptive research in ethics needs to explore and untangle this issue; this may lead to better educational approaches for practitioners.

The failure to estimate the effect of case manager characteristics on differences in care plan recommendations in specific sub-groups makes it impossible to explain the pattern of differences. This failure arose because the approach required segregating the data into small, conceptually distinctive sub-groups. The sub-groups were constructed to represent four-and five-way interactions of client variables (e.g., physical and cognitive disability and up to three types of preferences). It is therefore not surprising that some of the sub-groups would be quite small. Hence, while this approach provided conceptual clarity, it limited the ability to add explanatory variables to the model.

An alternate estimation approach needs to be developed to explore this variation. For example, by using the full data set, all the available information can be used to estimate the

case managers' individual variation. Then this variation can be segregated to test hypotheses about subgroups. One approach would be to use interaction terms to partition the variation. An additional model might test the hypothesis that the amount of variation is related to certain independent variables (e.g., that nurses are less variable than other types of case managers).

The existence of unexplained variation between case managers is an important finding. First, it is possible that the variables measured in the background survey did not capture relevant differences between individual case managers. Care was taken to measure variables that described caseload, target populations, and everyday responsibilities. The evidence suggests that a closer examination of the specific tasks case managers perform on a regular basis may be fruitful. Future research may examine other variables that were not included in this study.

Because the focus of this study was on professional and work-related factors, detailed personal questions were not included in the survey. It is possible that personal experience with disability or with disabled parents or family members may affect case managers' decision making. Similarly, differential personal experience with nursing homes and institutionalization may be a factor. Research into case managers' attitudes and values may also be a promising route. Wilcox & Taber (1990) examined case managers' attitudes toward familial responsibility and Micco et al. (1995) examined case managers' attitudes towards clients not having case management at all (i.e. client-directed home care). Kane, Penrod & Kivnick (1993) presented findings on several values issues pertinent to case management. While Clemens et al. (1994) found a disjunction between what case managers say and what they do, they looked at only a small group of case managers and did not conduct systematic surveys. In a future study, for example, data might be collected on case managers' values and attitudes as well as care plans for actual cases.

It is possible, however, that individual differences may persist even after measuring additional explanatory variables. If this is the case, then case manager decision making would not be much different from other subjects of health services research in terms of our ability to

make predictions (see Newhouse, Manning, Keeler & Sloss, 1989). Additional research is needed, however, to determine if there is an upper limit to the explanatory power of individual variables in this context. In particular, the present study did not allow the use of easily interpretable measures of variance explained. Analysis of other data collected as part of this study will allow such calculations to be done.

There are important policy and practice implications to the finding of individual differences. First, it is not clear whether variation in itself is a good or a bad finding. On the one hand, policy makers and program managers value creativity and customized approaches to clients' problems. However, state programs develop formal assessment tools and allocation formulas to reduce uncertainty when planning budgets and to assure equity. The tension between these two desires on the part of policy makers and program managers thus make it difficult to evaluate the findings.

That the same case might have opposite recommendations from two different case managers should nevertheless be a cause for concern. If case management is to remain a 'professional' task entrusted to individuals who use their experience and judgment to implement policies, then some individual differences will be tolerated. However, better oversight might be needed. Supervisory review of care plans, for example (see below), appears to have some effect on decision making; other mechanisms such as peer review activities were not examined in this study.

The alternative to trusting professional judgment is to reduce the breadth of case managers' discretion, for example, by using standardized care plans that are implemented automatically following a standardized assessment instrument. While this extreme has not been observed, the growth of computerized assessment and data systems for case management has the potential to reduce the flexibility allowed and individual discretion each individual. Furthermore, this would worsen the problem of "cookie-cutter" care plans. The development of explicit guidelines for case management reduce ambiguity in this respect: while guidelines may

be evidence of a trend away from reliance on individual judgment, they can be used for didactic purposes to clarify when judgment is called for and when there is consensus (or firm policy) on the right decision.

From an ethics perspective, variation in the extent to which client preferences are followed is problematic. On the one hand, while it is not surprising that individuals weight safety and autonomy differently, it is important to note that this is in response to the same set of facts. That is, different outcomes are obtained from different individuals in situations where the ethical conflict is the same. Taken as a normative system, the notion that decision makers should balance ethical principles according to the facts had been criticized for ignoring the social relationships of the 'client' (High, 1991). However, it leaves out the affective component of the professional decision maker as well. Should professionals be required to divorce themselves from their own personal circumstance, experience and prejudices when making recommendations? As a descriptive approach it is also inadequate: there are clearly relevant individual factors (both observable and unobservable) that effect case managers's decisions. A richer descriptive approach is needed that incorporates the position of the individual decision maker into the analysis of decision making in the context of ethical conflict.

6.5 Implications of findings about agency effects

There were five main findings with regard to agency effects and state dummy variables. The first finding was that there was a difference between agencies that separate case management tasks between intake and ongoing case managers and those that did not. Second, agencies that provided at least one home care service directly were different than those that did not provide any at all. Third, agencies that require supervisors to approve all care plans were different from agencies that do not. Fourth, there were a number of significant state dummy variables. Fifth, and finally, there were no unobserved agency effects after controlling for client, case manager, and agency variables.

The difference between agencies that separate tasks between intake and ongoing case

managers was discussed above under case manager effects. In general, intake case managers were more likely to recommend out-of-home placements than ongoing workers and case managers who did all case management tasks. The significant coefficient at the agency level can not be interpreted on its own; it must be combined with the individual level variable to make sense.

The second main finding had to do the potential for conflict of interest in agencies that provide in-home services as well as case management. It was hypothesized that case managers who work in agencies that also provide in-home services would be more likely to recommend in-home care plans. The rationale was that such an arrangement would enable them to increase revenue through self-referrals. While this study showed that case managers at such agencies were more likely to recommend interventions, they were less likely to recommend home care compared to out of home placement or nursing home placement, the opposite of what was expected. One possible explanation, consistent with the incentive to self-refer, is that case managers face an incentive to develop care plans that require little ongoing effort after being set up. They therefore attempt to avoid 'heavy' or difficult to serve cases that might demand too much case manager time and potentially reduce revenue. Regulations that require clinical supervision of direct care workers may encourage case managers at those to provide less case management monitoring.

An alternative explanation might be fear of liability. Case managers at agencies that provide direct care may have a greater sensitivity to liability issues. This might lead to a lower threshold for involvement with difficult cases in order to reduce exposure to liability. Case managers may not want to take responsibility for such clients, preferring to refer them to a nursing home.

The third major finding about agencies was that there was the effect of requiring supervisory approval for care plans. Case managers who worked in these types of agencies were less likely to recommend nursing home placements compared to home care or a group

home placement. (There was no effect of requiring supervisors to approve assessments.) One explanation for this finding is that a nursing home placement may be viewed as a failure of the case manager to develop a care plan that keeps the client safe at home (i.e. in the least restrictive environment). Closer supervision by more experienced individuals may lead to improved problem solving. Additionally, case managers may be more willing to establish an in-home plan for marginal (e.g. high risk) cases if they know they have approval from their supervisors.

Fourth, the finding that there were significant state dummy variables deserves some mention. Because the long-term care programs in the study were all state-wide programs, each state could be expected to have its own set of policies and procedures that are consistent across all agencies within that state. Because it was not possible to specify all possible differences between state programs, dummy variables were added to capture any overall pattern that might exist. Nevertheless, there was still considerable within state variation in agency factors (see Appendix C, Table 20). With one exception, there was no consistent pattern to the state dummy variables. Case managers from states with a high ratio of nursing home beds to beds in alternative residential settings were more likely to recommend nursing home placements.

Fifth, while initial models indicated some heterogeneity in the intercepts at the agency level, after adding the independent variables there was no residual variation. The case manager, agency and state dummy variables explained the variation among agencies. The significant coefficients at the agency level thus capture the pattern of differences. This does not necessarily prove that the agency level model was perfectly specified; there may be other agency level variables that are important to case manager decision making. The significant coefficients on several state dummy variables suggests that there may be other variables along which agencies differ.

These findings, taken together, suggest that case managers were influenced by their local environment and day-to-day organizational contexts. Study respondents were instructed to

follow a standardized set of program guidelines for completing the cases rather than apply the rules of their own agency or state program. The effects of agency level variables on the outcome (i.e. care plan recommendation) do not come from case managers' direct application of those rules. Instead these effects reflect the way the rules shape case managers' decision making e.g. shifting individuals' baseline recommendations in one direction or another. Differences between agencies and state programs in which they work cause individual case managers to start from different points along the spectrum from recommending home care to recommending a nursing home when considering the same case.

One implication of this finding is that program policies may have direct and indirect effects on case manager decision making. This study only examined indirect effects of agency factors. However, it is possible, likely, and indeed desirable, that agency policies have direct effects on how case managers perform. It is less clear that the indirect effects observed here are all positive. Indeed, one implication may be that case managers' individualistic decision making styles may be resistant to changes in policies at the state or local agency level. The finding that individuals appear to have incorporated these policies deeply into their individual cognitive processes may make it hard to change their behavior without substantial training. Policy makers need to recognize that regulations can create cognitive biases which may interfere with overarching program goals. Simply changing policies might not shift case managers' tendencies without careful attention to the effects these policies have on the decision makers themselves.

Finally, one argument that undergirded many of the study hypotheses was that greater levels of client contact would increase case managers' attention to client preferences and make them more likely to maintain clients at home. While there was some evidence that ongoing case managers, case managers who did all tasks, and case managers with fewer new clients were more responsive to client preferences, agency policies on client monitoring did not have any consistent effect. There was some slight evidence that more frequent monitoring leads to a

higher probability of a nursing home placement, however this finding did not show up consistently. There was no effect of home visits at all. While this null finding may diminish the strength of the positive findings, it is possible that poor measurement may have limited the strength of this variable. Specifically, this variable measured only the minimum required by the program, not the average or typical frequency of home visits or monitoring. It is possible that the actual intensity of client contact may be below or above the minimum requirements. If the process that leads to the actual intensity level is different than the process that sets the minimum requirements then the minimum and actual levels of client contact are poorly correlated. Unfortunately, this number was elicited from agency directors but not from case managers. Future research may examine the possibility of a link between the actual intensity of client contact and levels of attention to client preferences.

6.6 Further Research

There are four avenues for further research. The first is to continue to explore and refine the models presented in the main body of this dissertation. As noted above, further analysis revealed important interaction effects that have bearing on the interpretation of the results and suggest important ethical issues. Additional exploration of the structure of variation within case managers is beyond the scope of this dissertation. However, it is a fruitful area for further analysis.

The second avenue is to use the models developed so far as the starting point for exploring other data collected as part of the survey, but not yet analyzed. This includes data on the type and amount of in-home services that would be recommended, the likelihood of referrals for adult protective service investigation, and guardianship proceedings.

The third avenue is to focus on the validity of the vignette universe by comparing case managers' responses to what would be observed or expected about similar cases in the real world. External data sets, such as from the Channeling demonstration, can be used to describe

the long-term care arrangements that would be observed for a range of vignettes (e.g., nursing home placement rates for low risk and high risk clients). By comparing this to the present study, it will be possible to draw conclusions about the validity of case managers' responses. In particular, it would be important to compare the two ends of the spectrum of need. For example, it would be possible to compare case managers' recommendations for a client with few care needs, available family caregiving, and high agency budget to the observed long-term care arrangements for a similar case observed in an external data set. To the extent that both sources agree, this would bolster the validity of the present study. The same comparisons could be made for a high risk case could be examined. Additionally, the model derived from the present study can be used to generate simulations of the effect of client preferences (which are not part of other data sets) on use of long-term care at the national level.

A validity study as described above will help explain the high observed rate of interventions. It is possible that this finding revealed a tendency of case managers to want to intervene in all cases with home care (ie., the hammer and nail phenomenon). On the other hand the rate may be no higher than in other studies.

The fourth avenue is to collect data from a new sample of case managers, paying particular attention to workforce issues. Such data could then be combined with client data from administrative files to further examine the effects of agency variables on care plan recommendations. A survey of client preferences from the same agencies could be used prospectively to study the effect of client preferences on on care planning.

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APPENDIX A: PILOT TESTING

1. Introduction

This section presents results from a pilot test of the survey instruments. The main goal of the pilot test was to demonstrate the feasibility of using vignettes to study case manager decision making. A secondary goal was to collect data for estimating sample size needed for the actual study. The survey instruments were tested with case managers from two typical case management agencies in the state of Illinois. The agency directors gave the investigator permission to pilot test the surveys with case management staff as part of a site visit for an unrelated study. Participating case managers were each given a booklet containing a page of instructions and a set of vignettes followed by a series of questions (see Appendix B for final version of instruments). In Session 1, 20 case managers (including 3 supervisors) completed four vignettes each, yielding 80 vignettes. In Session 2, 18 case managers (including 1 supervisor) completed five vignettes each, yielding 90 vignettes.

2. Results

The two pilot testing sessions confirmed that vignettes can be used to elicit realistic care planning decisions from case managers. The participating case managers reported that the vignettes were realistic and that the decision making process they used to respond to the questions was similar to actual practice. They found the task interesting and were able to complete it in a reasonable amount of time without difficulty (each vignette took an average of 5-6 minutes). In general, most participants felt that the care planning options presented were comprehensive. In addition, an open-ended question about alternative services was left blank in the majority of cases.

The quantitative results further support the conclusion that case managers attended to the information in the vignettes and responded as they would to real clients. Case managers were more likely to allocate in-home services in response to vignettes that described more disabled clients. As the disability level increased, the likelihood of allocating services and the likelihood of recommending nursing home placement increased.

Case managers attended to client preferences for relocation to a nursing home: case managers were less likely to recommend nursing home placement for vignettes that described clients who did not want to relocate (6% v. 26%). Interestingly, however, case managers were slightly more likely to purchase personal care for clients whose preferences were not to receive it (54% v. 47%). This result may be due to fact that only a small sample of the possible vignette universe were used in the pilot testing. For example, the vignettes that described clients who did not want home care may have been more disabled than those who were willing to have home care. Another finding was that preference for nursing home care affects the likelihood of getting personal care: clients that do not want to relocate to a nursing home are slightly more likely to get personal care (56% v. 52%). Consistent with this, clients who do not want home care are more likely to be placed in a nursing home (21% v. 12%).

3. Conclusions

The quantitative results were generally in the expected direction. The variables describing client characteristics were considered realistic by participants and senior case management staff. The variables describing client preferences evoked an intriguing pattern of results. Finally, the care plan options that form the dependent variable were comprehensive of the services case managers regularly use.

APPENDIX B: INSTRUMENTS

1. Agency Survey

1.1 Cover Letter

1.2 Information Sheet

1.3 Case Manager Roster Form

1.4 Background Questionnaire

1.5 Reminder Card

1.6 Reminder Letter (Wisconsin Version)

1.1 Cover Letter

<Date>

Appendix B

«Director_FName» «Director_LName»

«Title»

«OrganizationName»

«Street1»

«Street2»

«City», «State» «Zip» «Plus_Four»

Dear «Polite» «Director_LName»:

I am writing to tell you about our national study of case manager decision making. This study, conducted by the University of Minnesota National LTC Resource Center, will involve approximately 1,800 case managers from more than 75 agencies in more than 10 state-wide long-term care programs that serve the elderly.

State-wide programs were chosen carefully to represent a range of case management approaches. Participating states have sent us lists of all relevant case management agencies, as well as the names of case managers themselves. STATE is one of the states in the study, and your agency was selected. The next step is to confirm the names of case managers working in each agency, after which we will draw a random sample of case managers to receive the survey. This multi-step procedure was designed to generate a representative sample of LTC case management for home and community based care for the elderly.

We enclose an attachment (on blue paper) that describes the study in a little more detail. To continue to the next step, we need two kinds of assistance from you:

- Please review the attached list of case managers working in your agency (on pink paper). This list was provided by STATEOFFICE, and may not be up to date. Please add any names that are not on the list and cross out any that are no longer working at your agency or no longer doing case management. Please include all case managers who work with the elderly, as well as nurses who do nursing home screenings. Also, include case managers who do assessments only, as well as those who carry ongoing caseloads.
- We also ask you to complete the attached 1-page form (on ivory paper) that collects some basic descriptors of your agency. These will be used as agency factors in analysis, however no agency will be identified in any way.

Please return the pink and ivory forms in the envelope provided by April 3rd.

Page 2

Case managers chosen for the sample will be sent a letter and a set of case scenarios about which we seek their responses. Needless to say, case managers' participation will be voluntary and anonymous. All lists of names will be discarded once the surveys are returned.

We are excited about this study, which should illuminate a poorly studied arena of human services. When the study is complete, we will be pleased to share the final results with you and your staff. In addition, we will provide you with an analysis of your agency and the overall averages of all study participants. We cannot, however, provide analyses of individual case managers because this would reach our promise of confidentiality. If you have any questions at all, do not hesitate to contact me or the study director, Howard Degenholtz. We deeply appreciate your assistance.

Sincerely,

Rosalie A. Kane, D.S.W.
Center Director

Howard Degenholtz
Study Director

enclosures

1.2 Information Sheet

Information about the National Case Manager Decision Making Study

What is the Case Manager Decision Making Study?

The Case Manager Decision Making Study is a national survey designed to examine how professional case managers for the aged make care planning decisions. The study is national in scope, and will involve about 1,800 case managers from more than 75 agencies more than 10 state-wide long-term care programs.

Who is Conducting the Study, and When?

The study is being conducted by the National Long-Term Care Resource Center at the University of Minnesota, with funding from the Administration on Aging. The Center has conducted empirical work on case management in the past, including studies of quality assurance issues in case management, ethical problems that case managers face, and the costs of case management. The present study is our most ambitious project to date due to the size and complexity of the design. Howard Degenholtz is Study Director, and Rosalie Kane, D.S.W., Director of the LTC Resource Center, is overseeing the study. Data collection will be completed in the Spring of 1996.

Why Study Case Managers?

Case management serves an important role in linking disabled older people to needed services. Although other studies have focused on the cost and outcomes of community-based long-term care, few have looked at how case managers working in these programs make allocation decisions. Given increases in the aged population and budgetary constraints, the case managers' gatekeeping role is of great interest. This study will provide important information about the range of decision-making practices among case managers.

Who Will be in the Study?

A three-stage process was used to generate a representative national sample of case managers. First, statewide case managed community based LTC programs were selected to represent the breadth of approaches. Second, local agencies within the states were randomly selected. The last step will be to randomly select up to 15 case managers from each selected agency.

What Will Participants be Asked to do?

Each case manager will be asked to complete and return a mailed survey, which asks questions about their decisions related to a series of case vignettes. The survey is anonymous, and takes about one hour to complete. Summary results, expected to be available in the Fall of 1996, will be shared with all participating agencies.

To Find out More, Contact:

The University of Minnesota National LTC Resource Center
420 Delaware St. SE, Box 197
Minneapolis, Minnesota 55455
Phone: (612) 624-5171 Fax: (612) 624-5434

1.3 Case Manager Roster Form

Case Manager Decision Making Study: Agency Part I
National LTC Resource Center FAX: (612) 624-5434

Agency: «OrganizationName» of «City», «State»

Please write the names of each case manager working at your agency. Use additional pages if necessary. You may attach a pre-printed list if available.

1.	_____	21.	_____
2.	_____	22.	_____
3.	_____	23.	_____
4.	_____	24.	_____
5.	_____	25.	_____
6.	_____	26.	_____
7.	_____	27.	_____
8.	_____	28.	_____
9.	_____	29.	_____
10.	_____	30.	_____
11.	_____	31.	_____
12.	_____	32.	_____
13.	_____	33.	_____
14.	_____	34.	_____
15.	_____	35.	_____
16.	_____	36.	_____
17.	_____	37.	_____
18.	_____	38.	_____
19.	_____	39.	_____
20.	_____	40.	_____

1.4 Background Questionnaire

Case Manager Decision Making Study: Agency Part II

National LTC Resource Center FAX: (612) 624-5434

Agency: «OrganizationName» of «City», «State»

Please complete the following information about case management in your agency and return using the enclosed envelope.

What is the average monthly budget for direct services (per client)? _____

How many new cases does your agency open in a typical month? _____

What revenue sources are used to pay for services authorized by your agency? (Circle Yes or No)

Medicaid Aged / Disabled Waiver	<u>No</u>	<u>Yes</u>
State Revenue Funding	<u>No</u>	<u>Yes</u>
Title XX	<u>No</u>	<u>Yes</u>
Title III (OAA)	<u>No</u>	<u>Yes</u>
Private Fees	<u>No</u>	<u>Yes</u>
Other (Please Explain): _____		

Does your agency purchase, broker or provide any of the following services? (Check all that apply)

	Purchase	Broker or Refer	Provide
Homemaker/Chore	—	—	—
Personal Care	—	—	—
Nursing Services	—	—	—
Transportation	—	—	—
Home Delivered Meals	—	—	—
Adult Day Care	—	—	—
Other: (Please Specify) _____	—	—	—

	Monthly	Quarterly	Annually	Other
How frequently do case managers monitor ongoing clients?	—	—	—	—
Apart from initial assessment, how frequently do case managers make home visits?	—	—	—	—

What is the average caseload for ongoing case managers? _____

What is the typical ratio of supervisors to case managers? _____

Do you use separate staff for intake and ongoing case management?	<u>No</u>	<u>Yes</u>
Must client assessments be approved by supervisors?	<u>No</u>	<u>Yes</u>
Must care plans be approved by supervisors?	<u>No</u>	<u>Yes</u>

UM9600«AgencyIndex»-A

1.5 Reminder Card



University of Minnesota
420 Delaware Street SE
Box 197 D-527 Mayo Bldg.
Minneapolis MN 55455

To:

The National Case Manager Decision Making Study . . .

Is depending on you, and over 250 case management agency directors like yourself, for the success of the project.

In order to have a truly representative, national sample, we need the participation of all the agencies selected at random for the survey. So, if you have already filled out the short survey we recently sent, then ignore this note and accept our thanks. Otherwise, please take the time to fill it out and return it in the postage-paid envelope by

If you did not receive a survey, or if you have any questions, please do not hesitate to call the study director, Howard Degenholtz, at (612) 624-5171.

Thank you for your time and assistance.

1.6 Reminder Letter (Wisconsin Version)

[Faint, illegible text block, likely a template for a reminder letter]

<Date>

«Director_FName» «Director_LName»

«Title»

«OrganizationName»

«Street1»

«Street2»

«City», «State» «Zip» «Plus_Four»

Dear «Polite» «Director_LName»:

Several weeks ago we sent you a letter inviting your agency to participate in our upcoming national study of case manager decision making. We have not received your response yet. Your participation is important to the success of the project. Each state-wide long-term care program was carefully chosen to represent a range of case management approaches. Along with 9 other state programs, we have selected Wisconsin's county social service agencies that serve the elderly through the Community Options Program. Your participation will help us develop a representative picture of case manager decision making.

The 10 state-wide programs were chosen carefully to represent a range of case management approaches. Participating states have sent us lists of all relevant case management agencies, as well as the names of case managers themselves. Wisconsin is one of the states in the study, and your agency was selected. The next step is to confirm the names of case managers working in each agency, after which we will draw a random sample of case managers to receive the survey. This multi-step procedure was designed to generate a representative sample of LTC case management for home and community based care for the elderly.

Your assistance is now needed to confirm the names of case managers working at your agency. We will draw a random sample from those among individuals to participate in the study. Each chosen case manager will be sent a letter informing them that they will be receiving a survey in the mail. The survey itself, which takes about one hour to complete, asks questions about care planning for a series of client case studies. Once the case managers complete and return the survey, we will destroy the list of names in order to guarantee confidentiality. This protocol was approved by our Institutional Review Board.

Page 2

Please take the time to read the enclosed description of the study (on blue paper), and return the two brief forms.

- Please review the attached list of case managers working in your agency (on pink paper). This list was provided by The Management Group, with the agreement of the State Department of Health and Social Services. Please add any names that are not on the list and cross out any that are no longer working at your agency or no longer doing case management. Please include all case managers who work with the elderly, as well as nurses who do nursing home screenings. Also, include case managers who do assessments only, as well as those who carry ongoing caseloads.
- We also ask you to complete the attached 1-page form (on ivory paper) that collects some basic descriptors of your agency. These will be used as agency factors in the analysis, however no agency will be identified in any way.

Please return the pink and ivory forms in the envelope provided by April 24th.

We are excited about this study, which should illuminate a poorly studied arena of human services. Although other studies have focused on the cost and outcomes of community-based long-term care, few have looked at how case managers working in these programs make allocation decisions. When the study is complete, we will be pleased to share the final results with you and your staff. In addition, we will provide you with an analysis of your agency and the overall averages of all study participants. We cannot, however, provide analyses of individual case managers because this would breach our promise of confidentiality. If you have any questions or concerns, do not hesitate to contact me or the study director, Howard Degenholtz. We deeply appreciate your assistance.

Sincerely,

Rosalie A. Kane, D.S.W.
Center Director

Howard Degenholtz
Study Director

enclosures

2. Case Manager Survey

2.1 Notification Letter

2.2 Cover Letter

2.3 Information Sheet

2.4. Instructions

2.5. Sample Vignette And Response Set

2.6 Background Questionnaire

2.7 Raffle Card

2.8 Reminder Letter

2.9 Q & A Information Sheet

2.10 Fax Return Sheet

2.1 Notification Letter



May 3, 1996

«First_Name» «Last_Name»
«OrganizationName»
«CMStreet1»
«CMStreet2»
«CMCity», «CMState» «CMZip»

Rosalie Kane
Director

Trish Riley
Co-Director

Mary Olsen Baker
Coordinator

Institute for Health

Services Research

School of Public Health

420 Delaware Street SE

Box 197

D-527 Mayo Building

Minneapolis MN 55455

612-624-5171

Fax: 612-624-5434

National Academy for

State Health Policy

50 Monument Square

Suite 502

Portland ME 04101

207-874-6524

Fax: 207-874-6527

Sponsored by the

Administration on Aging

Dear «First_Name» «Last_Name»:

You have been chosen to participate in our national study of case manager decision making. The study, conducted by the University of Minnesota National LTC Resource Center, will involve approximately 2,000 case managers from 190 agencies in 10 state-wide home and community based long-term care programs serving the elderly.

Here is how you became part of the study. First, 10 state-wide LTC programs were carefully chosen to represent a range of case management approaches. Second, case management agencies were randomly selected from each state. Finally, individual case managers were randomly selected from lists provided by each agency. This multi-step procedure generated a representative sample of LTC case managers in each participating state. Your opinions, therefore, are crucial to the study and cannot be replaced by those of another case manager.

In about a week we will mail you a survey packet which will take about an hour to complete. Although your agency is aware of and cooperating with the study, your responses will be kept confidential. Your name will not appear on the survey form itself. After the study is over, we will discard our mailing list. Of course, no names of individuals or agencies will appear in any publications or reports.

We are excited about this study, which should illuminate a poorly studied arena of human services. When the project is complete, we will be pleased to share the final results with you and your agency. If you have any questions at all, do not hesitate to contact the study director, Howard Degenholtz. Feel free to call collect at (612) 624-5171. We thank you in advance for your invaluable time and assistance with this study.

Sincerely,

Rosalie A. Kane, D.S.W.
Center Director

Howard Degenholtz
Study Director

2.2 Cover Letter



May 17, 1996

TO: Case Managers participating in the National Case
Manager Decision Making Study

Rosalie Kane
Director

FROM: Howard Degenholtz, Study Director

Trish Riley
Co-Director

Mary Olsen Baker
Coordinator

Thank you for agreeing to participate in our national study of case manager decision making. I can't emphasize enough how important your involvement is to the success of the study.

Institute for Health

Services Research

School of Public Health

420 Delaware Street SE

Box 197

D-527 Mayo Building

Minneapolis MN 55455

612-624-5171

Fax: 612-624-5434

Enclosed, you will find:

1. A booklet that contains all the material that needs to be completed and returned to us. The instructions are contained in the booklet itself;
2. A stamped envelope to use to return the booklet; and
3. An information sheet that describes what is entailed in your consent to participate in the study. You can keep this for your own records.

As a token of our appreciation, everyone who participates in this study will be eligible to enter a drawing for one of the following gifts related to case management practice:

National Academy for

State Health Policy

50 Monument Square

Suite 502

Portland ME 04101

207-874-6524

Fax: 207-874-6527

- 1 copy of the 1995 Encyclopedia of Aging;
- 5 one-year subscriptions to the Journal of Case Management;
- 5 copies of Ethical Conflicts in The Management of Home Care: The Case Manager's Dilemma, edited by Rosalie A. Kane and Arthur L. Caplan; and

Sponsored by the
Administration on Aging

Over . . .

Appendix B

- 10 copies of the training video and manual, Asking the Questions: How Case Managers Can Guide Their Clients Through the Comprehensive Assessment.

To be eligible for the drawing, write your name and address on the enclosed card and return it in the stamped envelope with your completed survey. As a more immediate and universal token of gratitude, a pen has been enclosed for your convenience in completing the packet.

It is possible that some of your colleagues are also participating in this study. Please complete your packet without discussion. We also urge that you turn this task in the next few days and return it within a week of your receipt of this letter.

Thank you again for your time and assistance with this study. It will be our pleasure to share the results with you at the end of the study.

2.3 Information Sheet

<p>1. Name of the project: [Project Name]</p>	
<p>2. Purpose of the project: [Project Purpose]</p>	
<p>3. Description of the project: [Project Description]</p>	
<p>4. Objectives of the project: [Project Objectives]</p>	
<p>5. Methodology of the project: [Project Methodology]</p>	
<p>6. Results of the project: [Project Results]</p>	
<p>7. Conclusions of the project: [Project Conclusions]</p>	
<p>8. Recommendations of the project: [Project Recommendations]</p>	
<p>9. Acknowledgements of the project: [Project Acknowledgements]</p>	
<p>10. References of the project: [Project References]</p>	

**INFORMATION FOR CASE MANAGERS ABOUT
THE NATIONAL CASE MANAGER DECISION MAKING STUDY**

This study is being conducted by the National Long-Term Care Resource Center at the University of Minnesota, with additional support from the Health Care Financing Administration. The National Long-Term Care Resource Center is funded by the Administration on Aging to serve the aging network with timely and practical materials and technical assistance. Our purpose is to disseminate current research and practical resources to professionals who work in the field of aging, as well as to conduct original research.

The purpose of this study is to understand how case managers make care planning decisions for their clients. Based on a list of all the case managers in your state's LTC program, participants' names were selected at random.

During extensive pre-testing of the survey materials, we did not identify any potential risks to respondents. The questions in the survey are not personal in nature, and you will not be asked anything that is outside everyday work experience. We expect the study to advance the state of the art in case management hope participation will prove interesting to those involved. The survey should take about an hour to complete.

We will maintain your confidentiality in all analyses and reports we generate. All results will be presented in the aggregate, and no names of individuals or agencies will appear in any published reports. It will also be impossible for agencies to identify responses of their employees. During the project, all data will be kept in a locked file drawer. All identifying information will be destroyed as soon as the project is over.

The decision whether or not to participate will not affect any future or current relationships with the University of Minnesota, the National Long-Term Care Resource Center or any funding agency. For this study, participation is limited to completing the enclosed survey.

For more information, feel free to contact the study director, Howard Degenholtz, by calling collect at (612) 624-5171.

National LTC Resource Center
University of Minnesota
School of Public Health
420 Delaware Street SE Box 197
Minneapolis, Minnesota 55455

2.4. Instructions

GENERAL INSTRUCTIONS

Please read these instructions completely before beginning the study.

This is a study of case manager decision making. We are interested in your opinions and your decisions as a case manager. There are no correct answers to these questions.

The following pages have a series of 18 case studies that were written to reflect the clientele of case management programs such as your own. Please read each one carefully, since they are all different. After reading each case study, you will be asked to choose a course of action from a list of four alternatives:

- A. Continue monitoring the case but do not arrange in-home services or nursing home placement;**

You continue monitoring the status of the client, but do not authorize any in-home services or recommend nursing home placement.

- B. Arrange an in-home care plan;**

You authorize services to be purchased on behalf of the client. As case manager, you are responsible for the ongoing monitoring and reassessment of the client.

- C. Recommend relocation to a small residential group home;**

A small group home or foster home is a non-institutional residential setting where some supervision is available. This may or may not include supportive services such as homemaker, personal care or adult day care, which would be paid for by your agency. The cost of the housing component would not be paid for by your program.

- D. Recommend relocation to a nursing home.**

You recommend to the client and or family that the client's needs would best be served in a nursing home. For the purpose of this study, all clients are eligible to have Medicaid pay for their nursing home stay.

Depending on which alternative you choose, you will be asked several further questions:

1. If you choose to arrange an in-home care plan (B), or if you choose relocation to a small group home (C), you will be asked to specify whether or not various supportive services should also be arranged, the type and the amount. You will be given space to calculate the cost of the proposed service plan to make sure that it does not exceed the available money.

The services you can purchase on behalf of clients living in their own homes or in small group homes are:

Homemaker. A homemaker can do IADL tasks such as chores and housekeeping, shopping, preparation of meals, and laundry. During one visit, a homemaker can do one IADL task. One visit costs \$10.

Personal Care. A personal care assistant can perform ADL tasks such as bathing, dressing, toileting, transferring, eating. During one visit, a personal care assistant can do one ADL task. One visit costs \$20.

Adult Day Care. Adult day care provides medical and social support for clients in a group setting. It also includes a meal and transportation to and from the day care center. One day costs \$40.

For clients that are served in their own homes or in small group homes, you will also be asked how likely you would be to make a referrals for home delivered meals and for home health service. These are defined as follows:

Home Health Service. A referral is made to a home health agency that can arrange for a home health aide to assist with medical care (e.g. wound care, arrange medications) under the supervision of a registered nurse. Your agency would not pay for home health services on behalf of the client.

Home Delivered Meal. A referral is made to a home delivered meals program. Home delivered meals are hot meals delivered once a day to the client's home and can be eaten, or saved for later. Your agency would not pay for the meals on behalf of the client.

2. If you choose to recommend relocation to a nursing home (D), you will be asked how likely you would be to begin commitment proceedings in order to have a legal guardian assigned to make decisions for the client. Commitment and guardianship are defined as follows:

Commitment & Guardianship. Your agency may initiate commitment proceedings, which include a legal determination of competence and a search for a suitable guardian.

3. For all cases, regardless of your choice of course of action, you will also be asked how likely you would be to start an adult protective service investigation. This is defined as follows:

Adult Protective Services. If abuse or neglect is suspected in a case, then Adult Protective Services will investigate and take proper action to ensure the safety of the client.

Final Note

For the purpose of this study, assume that these are the options you have available. Because there is great variety in community based long-term care programs across the country, we have identified this set of options and services as being common to most.

Try to put yourself in the position of case manager for the client described in the case study. Carefully consider the options and resources you are given for each case. Make the best decision you can for each client, as you would in your actual practice.

As you read each case, you should assume that you have monitored the client for about a year. Assume that the client is eligible for services, but has not been receiving any. During a scheduled reassessment, you gain the information presented in the case study and have to make a decision.

After you complete the case studies, please answer the questions on the last four pages (on pink paper) about your background. This will only be used for analysis purposes. Finally, please remember to fill out the card. The card will allow us to know who has responded without needing to print names on the booklet. Return both the card and this booklet in the stamped envelope.

Please return the completed booklet and card within one week of receiving it.

Thank you again for taking the time to participate in the study.

2.5. Sample Vignette And Response Set

Appendix B

CASE # 1

The client is a 86 year old woman who lives alone. She gets social security, has a small pension, and has some money saved up, but not a lot. She could contribute \$50 a month to help pay for her services. The client has a daughter who visits every day to help out.

- The client's physical condition is such that she has some difficulty with chores, laundry and preparing meals. She also has trouble washing and bathing herself without assistance, and needs a lot of help with transfers and getting dressed. She also has occasional 'accidents' where she wets the bed at night.

- The client has diabetes that needs careful control, including having her insulin syringes set up weekly to avoid serious medical complications. She is disoriented and confused most of the time.

- She wants to have family involved in her care as much as possible. She does not like having strangers in her home to take care of her. The client never wants to move to a nursing home.

Your agency can spend up to \$500 to purchase services for this client, in addition to what she herself can contribute.

1. SELECT COURSE OF ACTION

For the client described above, please select the course of action that you would follow. BE SURE TO CHECK ONE:

- A. ☐ Continue monitoring client, but neither recommend nursing home placement or in-home services. GO TO QUESTION 5.
- B. ☐ Arrange an in-home care plan. GO TO QUESTION 3.
- C. ☐ Suggest relocation to a small, residential group home. GO TO QUESTION 3.
- D. ☐ Suggest relocation to a nursing home. GO TO QUESTION 2.

2. COMMITMENT

If your suggestion to relocate to a nursing is not followed, would you begin commitment proceedings for this client so that a legal guardian can be assigned? Circle the number that best represents how likely you would be to begin commitment proceedings.

1	2	3	4	5
Definitely Would Not	Probably Would Not	Maybe, Maybe Not	Probably Would	Definitely Would

GO TO QUESTION 5

Appendix B

3. ARRANGE A SERVICE PLAN

Use the grid below to indicate the type and amount of services you would arrange. Write the number of Units per Month for each service, or check 'No Services' if you would not arrange that service at all. Multiply the Units per Month by the price given in parentheses to calculate the Dollars per Month. Add up the Dollars per Month to find the Total Dollars. Remember to stay within the available resources for this client. (Note that a month has 4 weeks)

Service	No Services	Units per Month	Dollars per Month
A. Homemaker (\$10 / hour unit)	<input type="checkbox"/>	_____	= _____
B. Personal Care (\$20 / hour unit)	<input type="checkbox"/>	_____	= _____
C. Adult Day Care (\$40 / day unit)	<input type="checkbox"/>	_____	= _____
Total Dollars			= _____

4. MAKE REFERRALS

Consider the following referrals you can make. These are services that your agency does not pay for directly. Circle the number that best represents how likely you would be to make a referral for that service and this client. Be sure to circle a number for each option even if you would not choose it.

	Definitely Would Not	Probably Would Not	Maybe, Maybe Not	Probably Would	Definitely Would
A. Home delivered meals	1	2	3	4	5
B. Home health services	1	2	3	4	5

5. ADULT PROTECTIVE SERVICES

How likely would you be to make a referral for an adult protective services investigation for this client? Circle the number that best represents how likely you would be to make the referral.

1	2	3	4	5
Definitely Would Not	Probably Would Not	Maybe, Maybe Not	Probably Would	Definitely Would

6. OTHER COMMENTS

Are there any other services, referrals, or actions you would consider for this client?
Please explain: _____

GO ON TO THE NEXT PAGE

2.6 Background Questionnaire

BACKGROUND QUESTIONS

Q1. What is your formal educational background? *Please check the all degrees awarded. Do not include degrees you are working toward. You may check more than one.*

1. ☐ BSW
2. ☐ MSW
3. ☐ BSN
4. ☐ MSN
5. ☐ RN
6. ☐ LPN
7. ☐ BA (Other than BSW or BSN): _____
8. ☐ Masters (Other than MSW or MSN): _____

Q2. Are you currently a licensed social worker?

1. ☐ No
2. ☐ Yes

Q3. How many years have you worked as a case manager? _____ Years

Q4. What is your gender?

1. ☐ Female
2. ☐ Male

Q5. For each of the following items please indicate whether or not it is a task that you do or do not do as a part of your case management work.

- | | Do Task: | Do Not
Do Task: |
|--|--------------------------|--------------------------|
| 1. Assessment | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Care planning | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Service authorization | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Client monitoring | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Reassessment | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Adult protective service investigations | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Supervise case managers | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Other, Please specify: _____ | <input type="checkbox"/> | <input type="checkbox"/> |

Appendix B

Q6. Which of the following sentences best describes what you do as a case manager? *Check One:*

1. ☐ Perform all case management tasks, including client intake, assessment, care planning, service authorization, monitoring, and reassessment.
2. ☐ Specialize in client intake, initial assessments and initial service plans, but not ongoing monitoring or reassessment.
3. ☐ Specialize in ongoing monitoring, and reassessment.
4. ☐ Specialize in conducting nursing home pre-admission screenings.
5. ☐ Specialize in adult protective service clients including investigation of abuse and neglect.
6. ☐ Supervise other case managers.
7. ☐ Other, please specify: _____

Q7. Please indicate whether or not you work with each type of client listed:

	Work With:	Do Not Work with:
1. Elderly disabled	<input type="checkbox"/>	<input type="checkbox"/>
2. Non-elderly disabled	<input type="checkbox"/>	<input type="checkbox"/>
3. MR/DD adults	<input type="checkbox"/>	<input type="checkbox"/>
4. MR/DD children	<input type="checkbox"/>	<input type="checkbox"/>
5. People with AIDS	<input type="checkbox"/>	<input type="checkbox"/>
6. Protective service clients	<input type="checkbox"/>	<input type="checkbox"/>
7. Other, please specify: _____	<input type="checkbox"/>	<input type="checkbox"/>

Q8. Please indicate which type of client makes up the largest part of your current case load.
Check One:

1. ☐ Elderly disabled
2. ☐ Non-elderly disabled
3. ☐ MR/DD adults
4. ☐ MR/DD children
5. ☐ People with AIDS
6. ☐ Protective service clients
7. ☐ Other, please specify: _____

Appendix B

Q9. About what percentage of your time do you spend providing counseling, psychosocial therapy, nursing services, or other hands-on care for your case management clients? *Please check the most appropriate answer.*

- | | | | |
|--------------------------|-----|--------------------------|----------|
| <input type="checkbox"/> | 0% | <input type="checkbox"/> | 30% |
| <input type="checkbox"/> | 10% | <input type="checkbox"/> | 40% |
| <input type="checkbox"/> | 20% | <input type="checkbox"/> | Over 50% |

Q10. How many new assessments did you conduct in the last full month?

1. ☐ None, does not apply
2. _____ Number of new assessments in the last full month

Q11. How many ongoing cases do you currently have?

1. ☐ None, does not apply
2. _____ Number of current clients

Q13. What is the most common payment source for your clients? *Check one:*

1. ☐ Home and Community Services Waiver (Medicaid Aged and Disabled Waiver)
2. ☐ State or County Funding
3. ☐ Title III
4. ☐ Private Fees
5. ☐ Other, please specify: _____

Appendix B

Q14. What types of training for resolving ethical conflicts or dilemmas do you rely on in your work as a case manager? Would you say you rely on:

		Rely On:	Do Not Rely On:
1.	Training you had in school	<input type="checkbox"/>	<input type="checkbox"/>
2.	What you have learned on the job	<input type="checkbox"/>	<input type="checkbox"/>
3.	Your religious values	<input type="checkbox"/>	<input type="checkbox"/>
4.	Books and articles	<input type="checkbox"/>	<input type="checkbox"/>
5.	A course or seminar in ethical decision making ..	<input type="checkbox"/>	<input type="checkbox"/>
6.	Your professional society	<input type="checkbox"/>	<input type="checkbox"/>

Which one? _____

Q15. Which source of training for resolving ethical conflicts or dilemmas do you rely on most.
Check one:

- 1. ☐ Training you had in school
- 2. ☐ What you have learned on the job
- 3. ☐ Your religious values
- 4. ☐ Books and articles
- 5. ☐ A course or seminar in ethical decision making
- 6. ☐ Your professional society

Thank you for completing the survey. Remember to complete the postcard to be eligible for the drawing. Please use the enclosed postage-paid envelope to return both the booklet and the card.

2.7 Raffle Card

NATIONAL CASE MANAGER DECISION MAKING STUDY



University of Minnesota
420 Delaware Street SE
Box 197 D-527 Mayo Bldg.
Minneapolis MN 55455

To be eligible for the drawing, please write your name and address below and return along with the completed survey.

First Name

Last Name

Organization

Street Address

Street Address

City

State

Zip

2.8 Reminder Letter



Rosalie Kane

Director

Mary Olsen Baker

Coordinator

Institute for Health

Services Research

School of Public

Health

420 Delaware Street

SE

Box 197

D-527 Mayo Building

Minneapolis MN 55455

612-624-5171

Fax: 612-624-5434

NLTCRC@umn.edu

Sponsored by the

Administration on

Aging

Aug 14, 1996

TO: «First_Name» «Last_Name»
«OrganizationName»
«CMStreet1»
«CMStreet2»
«CMCity», «CMState» «CMZip»

FROM: Howard Degenholtz, Study Director
Rosalie Kane, Center Director

SUBJECT: National Case Manager Decision Making Study

We still need to hear from you. If you haven't done so already, we urge you to join the almost 1,000 case managers who have responded to our mailed questions and case vignettes on case management decision making. Every response to this study is crucial to its scientific accuracy. The original mailing went to a representative, national sample of case managers, and thus your voice cannot be omitted or replaced by any one else without weakening the study. This is the first study of its kind to include long-term care case managers from a large number of states and programs across the country. It was designed and funded in recognition of the importance of your work.

It is possible that a telephone interviewer called a couple weeks ago to talk about the study and find out if you need a replacement booklet. We would like to extend that offer again. If you misplaced your packet, or never received one, please call collect (612) 624-5171, or simply mail or fax the enclosed pre-printed form, and we will send a new one as soon as possible.

Our telephone conversations impressed us once again with the interest the case managers have in the findings, and also underscored how busy your lives as case managers are. We know that it is difficult to carve out the time for this task. Some case managers are finding it helpful to do about 1/3 of it each day. Please see the attached Q & A sheet for a discussion of this and other issues often raised by the case managers. However you manage it, we deeply appreciate your help.

We remind you that all those who participate in the study will receive a copy of the results. We thank you in advance for taking the trouble to make this study a success. If you have already sent in your response, please accept our warmest thanks.

enclosures

2.9 Q & A Information Sheet

NATIONAL CASE MANAGER DECISION MAKING STUDY
Q & A SHEET

We have collected some of the common questions case managers have asked when our telephone interviewer called. Please look this over; you may share some of the same concerns.

Q: What if the deadline is past? Can I still turn it in?

A: We ask case managers to return the packet within about a week of receiving it, but we can use questionnaires that arrive later. We want to encourage people to send it promptly, so we can send out the results as soon as we can. However, feel free to take the time that you need to answer all of the questions.

Q: The questionnaire takes too long. I need to spend my time with real cases.

A: The case studies and questions were designed to answer scientific questions about case manager decision making. In order to answer these questions, we need to have a large enough sample of hypothetical cases from each person. Try to do about 1/3 each day; that way it won't take up too much of your time.

Q: Why do the cases all seem so similar?

A: We wanted to make the case studies as realistic as possible, however, there is a limit to the amount of variations that can be introduced and still be able to test the scientific questions of interest. The case studies have some common themes, but are all different from one another. Treat each one individually and give the best answer you can for that case. Again, if you work on the questionnaire in several sittings, the cases may be fresher for you.

Q: There doesn't seem to be enough information to make a good decision.

A: In real life there are often situations when there is not enough data; this is when judgment and experience come into play. Use your best sense of what is going on with the client, and write down any assumptions you are making in the space provided. Feel free to use the cover of the booklet to write further comments. This is a study of your judgment as a professional.

Q: The cost of the services in the scenarios too high (or too low).

A: When designing the study we wanted to make it relevant to a broad audience of case managers from very different programs. It was important to keep it as straightforward as possible, but still be based on national price data. As a result, the prices and service definitions may not be the same as what you are familiar with. Try to do your best within the budget, and remember, there are no right or wrong answers.

If you have any further questions, feel free to call collect at (612) 624-5171.

2.10 Fax Return Sheet



FAX COVER SHEET

Please Fax or Mail this form, and we will
send you a replacement booklet as soon as possible

TO: Howard Degenholtz
National Long-Term Care Resource Center
University of Minnesota
420 Delaware Street SE, Box 197
Minneapolis, MN 55455

FAX: (612) 624 - 5434

SUBJECT: National Case Manager Decision Making Study

NOTE:

Please send a replacement booklet to:

Thank you.

APPENDIX C: RAW DESCRIPTIVE STATISTICS

This section presents raw descriptive statistics from the case manager and agency surveys. The purpose is to describe the data that were collected and the steps taken to code the survey data into analytic variables.

1. Case Manager Survey

1.1 Response Rate

Of the 1001 returned surveys, five did not contain sufficient background information to be used in any analyses (See Table C.1 for explanation of each case). These five surveys were inadequate with regard to the vignette responses as well. The sample size available for descriptive statistics was therefore 996.

Table C.1 Cases with insufficient background information

Case	Reason
276	Omitted all Background Questions and answered "Nursing Home" to all vignettes
1519	Omitted all Background Questions, answered only 5 vignettes
2365	Omitted all Background Questions, answered only 2 vignettes
2747	Omitted all Background Questions, answered only 4 vignettes
2972	Responded "N/A" to questions about education and licensure, and omitted all questions pertaining to case management practice. This was the only response from the agency in question, and is likely to be a "group effort"

1.2 Descriptive Statistics

Training. Case manager training was measured in terms of completed post-secondary degrees and recoded into educational level and profession. Respondents could check all completed degrees from a list and write-in other degrees they held. Table C.2 shows the number and percentage of case managers with each degree.

Table C.2. Credentials

Degree	n	%
Bachelor's in Social Work	210	21.1
Master's in Social Work	67	6.7
Bachelor's in Nursing	112	11.2
Master's in Nursing	11	1.1
Registered Nurse	124	12.4
Licensed Practical Nurse	13	1.3
Bachelor's Degree (Other than BSW or BSN)	456	45.8
Master's Degree (Other than MSW or MSN)	119	11.9
No Degree Mentioned	60	6

n = 996

Examples of common bachelor's degrees other than BSW were psychology (42; 4.2%), sociology (31; 3.1%), and gerontology (6; 0.6%). Examples of common master's degrees other than MSW or MSN were counseling (25; 2.5%), psychology (12; 1.2%), gerontology (8; 0.8%), and sociology (3; 0.3%).

Based on the professional and academic degrees mentioned by survey respondents, two new variables were constructed (Table C.3), profession and educational level. Case managers with a BSW or MSW were categorized as having professional training as social workers (26.8%). Those with a BSN, MSN, RN or LPN were categorized as having professional training as nurses (20.9%). The largest number (53.2%) had neither nursing or social work training. A small number (9; 0.9%) had both nursing and social work training.

Educational level was categorized as the highest degree achieved, either at the bachelor's level (77.3%) or master's level (19.2%). Overall, 134 respondents (13.5%) did not

have either a bachelor's or master's degree. Of these, 60 indicated no degree at all and 74 (7.4%) indicated having some professional qualification (e.g. LPN, or RN). For the purpose of measuring educational level, only completed bachelor's or master's degrees were counted.

Table C.3. Professional Training and Educational Level

Variable	n	%
Professional Training ^a		
Social Work	258	25.9
Nursing	207	20.8
Neither Social Work or Nursing	530	53.2
Social Work and Nursing	9	0.9
Educational Level ^a		
Bachelor's	770	77.3
Master's	191	19.2
Neither	134	13.5

n = 996

^a Frequencies are for each category exclusively.

Licensure. Independent from professional training, case managers were asked if they were currently licenced social workers. There were 286 (28.7%) licensed social workers. Eleven respondents did not answer the question.

Years Worked. The number of years worked ranged from 0 to 37.5. Ten case managers left this question entirely blank, and 11 indicated zero years. The mean tenure was 6.9, the standard deviation was 6.1 and the median was 5 years.

Gender. The majority of case managers 857 (86%) were female . Three case managers omitted this question and were recoded using information from the mailing.

Case Management Tasks. Case managers were asked if they do any of a list of typical

case management tasks (Table C.4). The majority of respondents, 992 (99.6%) mentioned at least one task; four respondents (.4%) did not indicate any.

Table C.4. Case Management Tasks

Task	n	%
Assessment	922	92.6
Care Planning	963	96.7
Service Authorization	923	92.7
Client Monitoring	941	94.5
Re-assessment	908	91.2
APS Investigation	189	19
Supervision	104	10.4
Other	168	16.9

n = 996

Examples of common tasks written in the space provided for 'other' were nursing home preadmission screening (24; 2.4%) and elder abuse/protective service or guardianship (12; 1.2%)

Case managers were also asked what best describes their job as case manager (Table C.5). The raw frequency distribution is shown in the second and third columns. Twenty-eight (2.8%) case managers did not respond to this question, 81 (8.1%) mentioned more than one category, and 31 (3.1%) indicated 'other.'

The 59 cases that omitted this question or indicated 'other' were recoded based on information in the set of questions regarding the specific tasks they do (see Table C.4) as well as any 'other' text they might have written. Respondents who indicated that they do assessment, care planning, service authorization, monitoring and reassessment were coded as doing "All CM Tasks". Those who indicated they do assessment, care planning and service authorization, but

not monitoring were coded as doing "Intake Only". Those who indicated they do care planning and monitoring were coded as doing "Ongoing Case Management". One respondent had indicated APS under the list of tasks.

The 81 cases who indicated more than one category were recoded in a similar fashion using all the information available. The frequency distribution for the recoded variable is shown in the fourth and fifth columns of Table C.5. The majority of respondents (76%) do all case management tasks. Almost one fifth of the sample (18.7%) specialize in particular tasks.

Table C.5. Job Description

Job	Raw		Recoded	
	n	%	n	%
All CM Tasks	648	65.1	757	76
Intake Only	49	4.9	62	6.2
Ongoing CM Only	104	10.4	121	12.1
Nursing Home PAS	10	1.1	10	1.1
APS Investigations	11	1.2	12	1.2
Supervise CMs	34	3.4	34	3.4
Other	31	3.1	-	-
Omitted	28	2.8	-	-
Multiple Categories	81	8.1	-	-

n = 996

Type of Clients. Respondents were asked what type of clients they regularly work with. Table C.6 shows the number and percent that work with each type of client and Table C.7 shows the types of clients that make up the largest part of the respondent's case load. The overwhelming majority (967; 97.1%) of case managers indicated that they work with disabled elderly clients. Twenty-two respondents (2.2%) did not indicate the type of clients they work with, and one answered 'no' to options.

Table C.6. Type of Clients

Task	n	%
Elderly Disabled	967	97.1
Non-Elderly Disabled	541	54.3
MR/DD Adults	440	44.2
MR-DD Children	175	17.6
People with AIDS	377	37.9
APS Clients	625	62.8
Omitted	22	2.2
Other	119	11.9

n = 996

Respondents who did not answer the question about the type of clients that make up the largest part of their caseload (24 cases) were recoded based on information in the previous set of questions about which types of clients they work with. Priority was given to working with the elderly disabled; i.e. those that indicated that they work with the disabled elderly as well as some other population were placed in the elderly disabled category. The same strategy was used for respondents who indicated 'other' or who checked multiple categories. [A small number of case managers (2) indicated that they work with non-disabled elderly clients. These were recoded into the 'elderly disabled' category.] After recoding, 878 (92.4%) of respondents are categorized as working with the elderly disabled. Twenty respondents (2.1%) did not provide any information about their caseload.

Table C.7. Largest Part of Caseload

Job	Raw		Recoded	
	n	%	n	%
Elderly Disabled	831	83.4	915	91.9
Non-Elderly Disabled	31	3.2	31	3.1
MR/DD Adults	11	1.1	11	1.1
APS Clients	12	1.2	12	1.2
MR-DD Children	5	0.5	5	.5
People with AIDS	0	0.0	0	0.0
Other	51	5.1	-	-
Omitted	27	2.7	22	2.2
Multiple Categories	28	2.8	-	-

n = 996

Direct Care. Respondents were asked the proportion of time they spend providing direct, hands-on care. This was defined as counseling, psychosocial therapy, or nursing services. Table C.8 shows the distribution of the amount of time spent doing direct care. More than two-thirds (68.4%) of the sample indicated that they spend 10% or more of their time in direct care.

Table C.8. Proportion of Time Spent Giving Direct care

Proportion of time	n	%
0 %	297	29.8
10 %	239	24.0
20 %	139	14.0
30 %	112	11.2
40 %	79	7.2
50 % or More	69	6.9
Omitted	61	6.1

n = 996

Case Activity. Respondents were asked two questions about their case activity: the number of new assessments that they did in the last full month, and the current number of clients in their case load. Respondents that omitted these questions (30, 27), were omitted from calculation of descriptive statistics. Cases where “None, Not Applicable” was indicated were coded as zero. The average number of new cases was 5.9 and the average caseload was 61 (Table C.9).

Table C.9. Number of New Assessments and Caseload

	n	%	Min	Max	Mean	Median	S.D.
New Assessments ^a			0	60	6	4	7.6
None, N/A	239	24.0					
At Least One	725	72.8					
Omitted	32	3.2					
Caseload ^a			0	335	61.5	56	43.1
None, N/A	83	8.3					
At Least One	884	88.8					
Omitted	29	2.8					

n = 996

^a "None, N/A" coded as zero.

Funding Source. Respondents were asked to indicate the funding source for the majority of their clients. This question was intended to identify case managers who, while working in agencies that use Medicaid HCBS Waiver funding, mostly handle clients funded through a different mechanism. Table C.10 shows the breakdown by funding source. The most common was HCBS Waiver programs (57.9%), followed by state or county funds (28%). The responses for those who indicated 'other' were reviewed, and a new category was created to capture people who worked in programs funded by Social Services Block Grants (28; 2.8%). Those who wrote the name of the HCBS Waiver program, or their state-county program were re-coded appropriately. Respondents who indicated that their clients are funded from multiple sources were re-coded as follows. If one of the programs was either a HCBS Waiver or state/county program, they were placed in the appropriate category. Those who indicated that both Waiver and State/County sources were used were placed in a new category "HCBS Waiver and State/County".

A small number (14) did not fall into any major category. Four indicated that charity or grant monies are used; one mentioned Medicaid; one indicated a combination of Medicare and

private fees; and one indicated SSI and Social Security. Seven did not mention any funding source, indicating that either their services carry no charge to clients or are unfunded (e.g. protective service).

Table C.10. Major Funding Source

Source	Raw		Recoded	
	n	%	n	%
HCBS Waiver	536	53.8	577	57.9
State/County Program	261	26.2	279	28.0
HCBS Waiver and State/County	-	-	38	3.8
Social Services Block Grant	-	-	28	2.8
Title III	17	1.7	19	2.0
Private Fees	8	.8	10	1.0
Other	74	7.4	14	1.4
Omitted	34	3.4	31	3.1
Multiple Categories	66	6.6	-	-

n = 996

Source of Training for Ethical Conflicts. Respondents were asked what sources they used for resolving ethical conflicts they encounter in their regular duties. The number who indicated each source is listed on Table C.11. The most common source mentioned was on the job training (93.6%). Five respondents answered 'no' to all possible sources (.5%), and 37 omitted the question entirely (3.7%).

Table C.11. Source for Resolving Ethical Conflict

Source	n	%
What you learned in school	703	70.6
On the job training	932	93.6
Religious values	493	49.5
Books and Articles	596	59.8
Course or Seminar	493	49.5
Professional Society / Other	197	19.8
No to all	5	0.4
Omitted	37	3.7

n = 996

Respondents were then asked which source they rely on the most (Table C.12). The most common category was 'on the job' (59.4%). Of the 58 respondents who omitted this question, 2 indicated a single source under the previous question and were recoded into that category. Fifteen (15) others indicated more than one category for the previous question and were recoded with the 'multiple' responses.

Table C.12. Most Important Ethics Source

Source	Raw		Recoded	
	n	%	n	%
What you learned in school	96	9.6	96	9.6
On the job training	593	59.5	595	59.7
Religious values	93	9.3	93	9.3
Books and Articles	8	.8	8	.8
Course or Seminar	26	2.6	26	2.6
Professional Society / Other	31	3.1	31	3.1
Multiple Categories	91	9.1	106	10.6
Omitted	58	5.8	41	4.1

n = 996

Of the 31 (3.1%) respondents who indicated that their most important source for resolving ethical issues was their professional society, 14 wrote something in the space provided. Six mentioned the National Association of Social Work (NASW), three mentioned nursing, two mentioned an LSW (licensed social worker) group, two mentioned ethics discussion groups, and one indicated following a 'code of ethics'.

Table C.13. Most Important Ethics Source for Multiple Categories

Source	Raw	
	n	%
What you learned in school	76	71.7
On the job training	103	97.2
Religious values	53	50.0
Books and Articles	65	61.3
Course or Seminar	61	57.5
Professional Society / Other	22	20.8

n = 106

2. Agency Survey

2.1 Response Rate

Of the 263 agencies surveyed, 211 provided usable information. However, 12 of these had no case managers return the final survey. This following section presents descriptive statistics for the full sample of 211 and the effective sample of 199.

2.2 Descriptive Statistics

Average Monthly Budget. Agency directors were asked to write the average per client monthly budget for direct services. The mean value did not differ significantly between the respondent set and the 12 agencies with no respondents.

Table C.14 Average Per Client Per Month Budget

	Valid Sample Size ^a	Mean	Median	S. D.	Min	Max
Surveyed	176	519.8	361.5	626.4	44	5465
Respondent	168	526.6	387.5	634.4	44	5465

^a Three outliers with budgets of 10145, 14700, and 25000 were removed from calculations.

New Cases. Agency directors were asked to indicate the number of new cases their agency added in the last full month. This number ranged from 0 to 4900. Numbers at the high end of this range likely reflect policy changes occurring during the time period of the study.

Table C.15 Number of New Cases Opened in a Typical Month

	n	Missing	Mean	Median	S. D.	Min	Max
Surveyed	211	16	173.5	16	775.5	0	4900
Respondent	199	16	184.5	18	799.4	0	4900

Source of Revenue. Agency directors were asked to indicate what sources of revenue they use to purchase services on behalf of their clients. The majority (94%; 94%) use Medicaid Waiver funds.

Table C.16 Source of Revenue

Source	Surveyed (n = 211)		Respondent Set (n = 199)	
	n	%	n	%
Medicaid Waiver	199	94.3	187	94.0
State Revenue	179	84.8	168	84.4
Title XX	93	44.1	90	45.2
Older Americans Act	141	66.8	131	65.8
Private Fees	109	51.7	104	52.3
Other	56	26.5	54	27.1

Services. The types of services case managers can arrange for their clients were indicated on a grid that allowed the agency director to specify if each service was arranged at all, purchased, brokered, or provided directly by the agency (Table C.16)

Table C.17 Services

Services		Surveyed (n = 211)		Respondent Set (n = 199)	
		n	%	n	%
Homemaker	Arrange at all	208	98.6	196	98.5
	Purchase	136	64.5	133	66.8
	Broker	92	43.6	90	45.2
	Provide	58	27.5	49	24.6
Personal Care	Arrange at all	206	97.6	195	94.7
	Purchase	133	63	131	65.8
	Broker	98	46.4	95	47.7
	Provide	43	20.4	35	17.6
Nursing	Arrange at all	176	83.4	171	85.9
	Purchase	86	40.8	84	42.2
	Broker	120	56.9	115	57.8
	Provide	20	9.5	20	10.1
Transportation	Arrange at all	201	95.3	190	95.5
	Purchase	128	60.7	124	62.3
	Broker	91	43.1	89	44.7
	Provide	59	28	51	25.6
Home Delivered Meals	Arrange at all	203	96.2	191	96
	Purchase	101	47.9	98	49.2
	Broker	89	42.2	87	43.7
	Provide	68	32.2	59	29.6
Adult Day Care	Arrange at all	177	83.9	173	86.9
	Purchase	112	53.1	110	55.3
	Broker	87	41.2	84	42.2
	Provide	26	12.3	25	12.6
Other	Arrange at all	95	45	89	44.7
	Purchase	47	22.3	47	23.6
	Broker	34	16.1	34	17.1
	Provide	36	17.1	30	15.1

Client Monitoring & Home Visits. The frequency of client monitoring and home visits was collected with a check box for 'monthly', 'quarterly', 'annually', or 'other'. A space was provided to indicate another frequency. The check boxes and the open ended text were recoded to indicate the per year frequency (e.g., 'quarterly' = 4). If the agency director noted that there was no minimum frequency, or that monitoring and home visits were done only 'as needed', the response was coded as zero.

Table C.18 Frequency of Client Monitoring and Home Visits

		Minimum Required per Year n (%)						
	n	0 ^a	1	2	3	4	6	12
Monitor								
Surveyed	211	22 (10.4)	2 (0.9)	5 (2.4)	4 (1.9)	83 (39.3)	0 (0)	95 (45)
Respondent	199	22 (11.1)	2 (1)	5 (2.5)	4 (2)	75 (90.4)	0 (0)	91 (95.8)
Home Visit								
Surveyed	211	16 (7.6)	12 (5.7)	29 (13.7)	7 (3.3)	120 (56.9)	8 (3.8)	19 (9)
Respondent	199	16 (8)	12 (6)	29 (14.6)	7 (3.5)	109 (90.8)	8 (4)	18 (94.7)

^a No specific interval or 'as needed'.

Supervision & Division of Labor. Agency directors were asked questions about the organization of staff into separate intake and assessment personnel and whether supervisory approval is needed for all assessments and care plans. The responses to these yes/no question are shown on Table C.18. Slightly more than half (52.8%) of agencies use separate staff for intake and assessment. Somewhat less than half require supervisors to approve assessments (40.7%) and careplans (44.2%).

Table C.19 Supervision and Division of Labor

	Surveyed (n = 211)		Respondent Set (n = 199)	
	n	%	n	%
Separate staff for intake and assessment	106	50.2	105	52.8
Supervisors must approve assessments ^a	89	42.1	81	40.7
Supervisors must approve careplans ^a	96	45.5	88	44.2

^a Blank and miscellaneous responses coded to 'no'

Ratio of Supervisors to Case Managers. The average number of case managers per supervisor (Ratio) is shown on Table C.19. Nine agencies (seven in the respondent set) left this item blank or indicated that it was not applicable. For these cases, the number of eligible case managers in the agency was used. Columns 1, 2 and 3 of Table C.19 are based on the sample with complete data, and columns 4, 5 and 6 are based on the replacement.

Table C.20 Ratio of Supervisors to Staff and Average Caseload

	Surveyed (n = 211)			Respondent Set (n = 199)		
	Valid Sample	Mean	SD	Valid Sample	Mean	SD
Ratio	201	7.7	4.8	199 ^a	7.7	4.0
Average Caseload	203	69.4	29.1	199 ^b	69.4	29.6

^a Blank responses replaced with number of case managers on staff.

^b Blank responses replaced with average of individual caseload from case manager survey.

Average Caseload. The average caseload is shown on Table C.19. For eight agencies that omitted this information entirely, the caseload information from the individual case managers who responded to the survey from that agency was averaged. The average for the response set was about 69 cases per case manager.

State-by-State Variation. Table C.20 shows each agency variable, after recoding, for the analytic sample broken down by state. Means and percentages only are shown.

Table C.21 State-by-State Variation in Agency Variables

Variable (statistic)	State										
	CA	CO	CT	FL	GA	IN	M A	M N	O H	WA	WI
Number of CMs (Mean)	9	9	12	7	5	1	16	7	18	16	8
Frequency of In-Home Visits (Mean)	6	2	2	4	4	2	3	5	5	3	5
Frequency of Client Monitoring (Mean)	12	4	12	5	4	5	4	7	11	8	11
Average Case Load (Mean)	44	66	70	74	87	98	85	53	45	99	44
Ratio of CMs to Supervisors (Mean)	8	8	16	5	5	8	9	8	7	7	9
Separate Intake and Ongoing Staff (Percent)	59	36	100	52	21	33	81	28	69	57	52
Provide Any Services (Percent)	41	27	0	91	58	87	69	67	0	39	25
Broker Only (Percent)	0	55	0	0	37	7	0	0	17	8	0
Supervisors Approve Care Plans (Percent)	94	9	0	36	5	47	5	0	42	8	86
Supervisors Approve Assessments (Percent)	65	18	0	33	21	53	59	0	50	8	68
Budge Quartile: ^a											
Under 186.5	100	36		33	11	7	6	22		8	22
186.5 to 421				15	53	27	94	22			21
422 to 669		5	100	42	26	60		44	25	23	31
Over 699		2		9	11	7		11	75	69	27

^a Percentages may not sum to 100% due to rounding.

APPENDIX D: SELECTION BIAS STUDY

1. Introduction

As the main data collection effort drew to a close, it became apparent that the projected response rate would be close to 50%. While this is higher than many mailed studies of professional decision making, an respectable given the heavy response burden, it is far below rates usually considered to be 'good', e.g. 80-90%. With such a low response rate, it is important to consider the possibility of sample bias and the effects on generalizability. Sample bias can arise if non-respondents are systematically different from respondents along dimensions associated with the dependent variable. For example, if professional training were a significant predictor of a key dependent variable, but people with professional training were less likely to respond to the survey than non-professionals, then the estimates of the effect of professional training will be biased. More generally, if the sample of survey respondents is significantly different from those originally in the sampling frame, then the results may not generalize to the broader population.

2. Methods

To determine if these effects occurred in conjunction with the present study, a small survey of non-respondents was conducted. Using random sampling within approximately 1000 non-respondents, the names and addresses of 293 were drawn (a 25% fraction was used, however sampling error lead to a larger number being selected). A brief version of the background survey (see Section 5 of this Appendix) was developed which included a subset of the questions. A subset of questions that fit on a single page were selected in order to minimize respondent burden. Although no analysis had been conducted at this time, questions were chosen that were anticipated to be key independent variables in the main study. The questions covered professional training, educational level, case management tasks, client population, the number of years worked as a case manager, the number of new cases and caseload.

In addition, case managers were given an opportunity to participate in the main study

itself. If they requested it, a new survey was sent out. If they still had their original survey, or if they had filled out the main survey and the bias study had crossed in the mail, they could indicate this on the form.

To maximize response to the survey, each case manager was sent a personalized letter asking them to participate. Enclosed was a single page survey with the return address printed on the back so it could easily be folded and mailed. A fax number was printed on the front. Finally, everyone in the sample who did return the survey within the first few weeks was contacted by telephone and asked to complete the questionnaire on the phone or have a new copy faxed to them.

Chi-square and T-tests were calculated as appropriate to compare the characteristics of the bias survey sample to the main study sample.

3. Results

Table D.1 shows the breakdown of the 293 respondents. More than two-thirds of the sample (199) case managers completed and returned the bias survey. Twenty (20; 7%) were no longer employed at the agency listed in the database, and had no forwarding information available. Three (3; 1%) respondents indicated that they were not case managers, 55 (18.8%) did not return the survey at all. There were three (3; 1%) case managers who specifically refused to participate in the bias survey, and four (4; 1.4%) who were on leave and thus unavailable during the time the bias survey was conducted. Nine case managers in the bias sample 'converted' to the main study.

Table D.1. Respondent Status for Bias Survey

Status	n	%
Complete	199	67.9
Not Employed at Agency/No Forwarding Information	20	6.8
Not a Case Manager	3	1
Not Returned	55	18.8
Refusal	3	1
On Leave/Unavailable	4	1.4
Converted to Survey Respondent	9	3.1
Total	293	100

Of the 199 respondents who completed the survey, 17 (8.5%) did not work with the elderly at all and 18 (9%) did not do any of the core case management tasks. Because these two groups could overlap, only 23 (11.5%) respondents were excluded, leaving a sample of 170. Overall, 19.8% of surveyed case managers refused to participate in the bias survey.

Table D.2 shows the comparison of case manager characteristics in the bias survey sample to the main study sample. There were no statistically significant differences between the two samples, with one minor exception. There appeared to be slightly fewer nurses in the bias study (14%) than in the main study (21%), however this was only marginally significant ($p = .045$), and thus does not indicate that there was any pattern of systematic differences.

Table D.2. Comparison of Case Manager Characteristics in Bias Sample and Main Study Sample

Variable	Bias Sample (n = 170)		Main Study (n = 830)	
	n	%	n	%
Social Worker	46	27.1	232	28
Nurse	24	14.1	173	20.8
Licensed Social Worker	52	31	247	29.8
Bachelors	116	68.2	556	67
Masters	28	16.5	160	19.3
Intake	6	3.5	59	7.1
Ongoing	23	13.5	99	11.9

Variable	Bias Sample (n = 170)			Main Study (n = 830)		
	Mean	Range	SD	Mean	Range	SD
Years Worked	7.9	0.17 to 37	6.6	6.2	0 to 37.5	7.6
New Assessments	6.8	0 to 125	12	6.9	0 to 60	6.2
Case Load	66	0 to 180	28	63.6	0 to 335	42.3

* p = .045

4. Conclusions

The bias study demonstrated that a random sample of non-respondents was not statistically significantly different than the survey participants. This implies that while the main study experienced a low participation rate, there was not serious selection effect that might bias the results or question the generalizability of the study.

The participation rate in the bias study was not perfect. No data were collected for 19.8% of the sample. An additional 12% did not participate for a variety of reasons. Because the sample was drawn at random, it is safe to assume that the reasons given for not participating would parallel the proportion in the remainder of the non-respondents. Thus it is legitimate to consider the results of the bias study as representative of the population of non-respondents.

5. Instrument

BACKGROUND QUESTIONS

Q1. What is your formal educational background? *Please check the all degrees awarded. Do not include degrees you are working toward. You may check more than one.*

☐ BSW ☐ BSN ☐ BA (Other than BSW or BSN): _____
☐ MSW ☐ MSN ☐ Masters (Other than MSW or MSN): _____
☐ RN ☐ LPN

Q2. Are you currently a licensed social worker? ☐ Yes ☐ No

Q3. How many years have you worked as a case manager? ☐ Years

Q4. As part of your work as a case manager, do you supervise other case managers at all?

☐ Yes ☐ No

Q5. Which of the following sentences best describes what you do as a case manager? *Check One:*

- ☐ Perform all case management tasks, including client intake, assessment, care planning, service authorization, monitoring, and reassessment.
☐ Specialize in client intake, initial assessments and initial service plans, but not ongoing monitoring or reassessment.
☐ Specialize in ongoing monitoring, and reassessment.
☐ Specialize in conducting nursing home pre-admission screenings.
☐ Specialize in adult protective service clients including investigation of abuse and neglect.
☐ Supervise other case managers.
☐ Other, please specify: _____

Q6. Please indicate which type of client makes up the largest part of your current case load. *Check One:*

- ☐ Elderly disabled ☐ People with AIDS
☐ Non-elderly disabled ☐ Protective service clients
☐ MR/DD adults ☐ Other, please specify: _____
☐ MR/DD children

Q7. How many new assessments did you conduct in the last full month?

☐ Number new assessments in the last full month ☐ None, does not apply

Q8. How many ongoing cases do you currently have?

☐ Number of current clients ☐ None, does not apply

Thank you for completing these questions. Please fax to (612) 624-5434
Or follow the directions on the reverse to mail.

APPENDIX E: ANALYSIS OF UNDERDISPERSION IN DECISION TO INTERVENE

When fitting the hierarchical model with random intercepts and slopes, it is important to determine if the estimates meet distributional assumptions. This was done for each of the models estimated as part of this dissertation. The only model where the intercepts and slopes did not follow a normal distribution was in the decision to intervene.

The top two graphs in Figure 1 show the frequency distribution of the agency specific intercepts and the lower two graphs show the normal plot and 95% confidence intervals for each point. The distribution of the intercepts is skewed to the right and deviates somewhat from normality. Figure 2 shows the distributions, normal plots and 95% confidence intervals for the estimates of the case manager level intercepts and slopes. Each deviates considerably from normality.

An additional consideration for judging the appropriateness of the statistical model is the distribution of the dependent variable. It is possible to test empirically if the dependent variable comes from the binomial distribution, as is assumed by the model. A 'dispersion parameter' added to the estimation equation captures deviations from the binomial distribution (see Chapter 3, equation 4). If this 'dispersion parameter' is approximately one, then the binomial distribution fits. Otherwise the data are considered 'underdispersed.' The estimate for the present data set was 0.83. This implies that there was significantly less variation than would be expected if the data were distributed binomially.

The finding of underdispersion was not surprising due to the vastly uneven marginal distribution of the dependent variable (96.6% of cases were in the 'intervene' category). In a traditional, non-hierarchical logit model, underdispersion is not a major problem distinct from the unbalanced marginal. In the hierarchical model, however, it can arise if all observations in a higher level unit have the same value for dependent variable. This can arise if, for example, a case manager answered all vignettes by selecting some intervention and no vignettes with 'continue monitoring.' The effect of such a pattern of responses is that the within-case manager

variance is zero and it is impossible to estimate random effects for those cases.

Another possible source of underdispersion is mis-specification of the random structure of the model. That is, the intercept or certain slopes actually vary between case managers or agencies, however the model assumes that they do not. This is not a likely explanation in the present analysis because the initial estimates allowed the intercept and slopes to vary at both levels and not all terms were significant.

Of the 830 case managers in the sample, 475 (57%) had the same value for the decision to intervene in all vignettes presented to them. In all 7865 vignettes rated by these 475 case managers an intervention was recommended. Of the 43% of case managers whose responses varied, some type of intervention was recommended for 85% of all vignettes.

A logistic regression was done to determine if case managers whose answers varied were different from case managers who gave the same response to each case. All case manager and agency variables were included, as well as an indicator for each state. Only four variables were significant predictors. Case managers who had a social work background (compared to nursing or no professional background), were nearly twice as likely to answer all cases the same way (OR 1.8; $p=.002$). Case managers who were licensed social workers were about half as likely to answer all cases the same way (OR 0.61; $p=.021$). Case managers who worked in agencies that required assessments to be approved by supervisors were less likely to answer all cases the same way (OR 0.45; $p=.005$). Finally, case managers from the state of Wisconsin were more likely to answer all cases the same way (OR 3.74; $p=.014$). Table 1 shows the bivariate contrasts for each variable. Note that the pattern of significance is different because the comparison category in the multiple logistic regression is the base category of all variables, whereas in the separate bivariate contrasts the comparison is irrespective of the other variables.

Based on the analysis of variation within case managers and the results of the logit, a restricted sample was generated with the 355 case managers whose responses on a total of

6079 vignettes varied within the individual on the decision to intervene. As before, a preliminary model with only client characteristics was run to provide estimates of the variance in the parameters hypothesized to vary across case managers and agencies. Only those variances found significant in the initial model were estimated.

Figure 3 shows the distribution of the parameter estimates, normal plots and 95% confidence intervals for the case manager level intercepts and slopes. Since there variance in the agency level intercept was not statistically significant, there were no agency-specific intercepts to plot. The intercepts and slopes from the restricted sample appear to be deviate only slightly from a normal distribution. The restricted sample was therefore used for all subsequent model building.

Figure 1 Decision to Intervene (Initial Model):
Distributions and Normal Plots of Agency Specific Intercepts

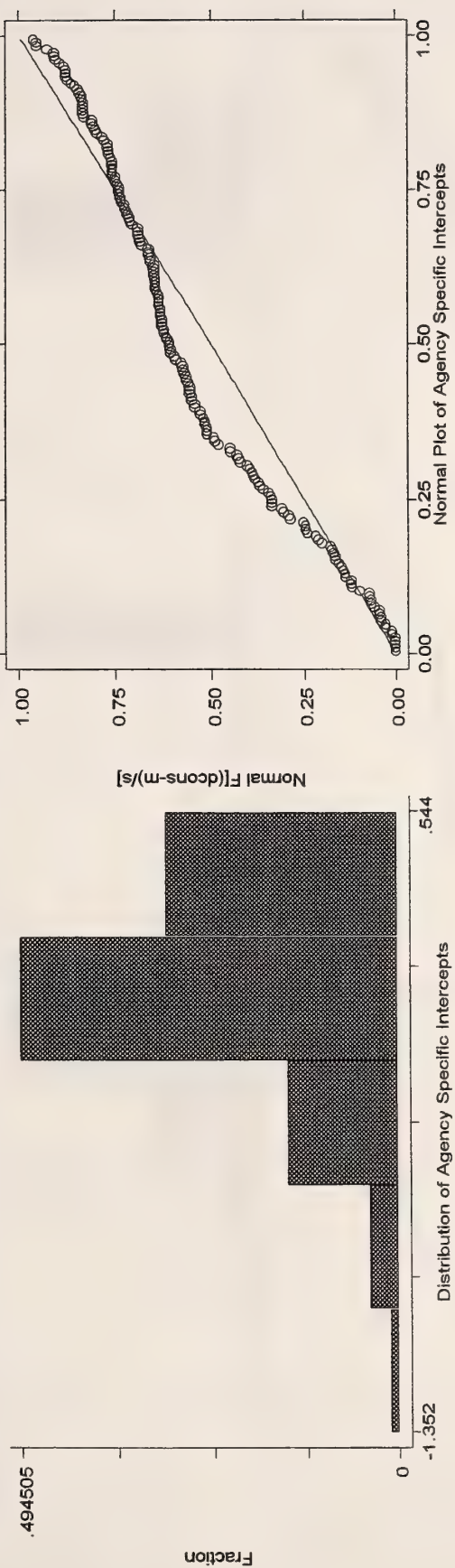


Figure 2 Decision to Intervene (Initial Model):
Individual CM Intercepts and Slopes

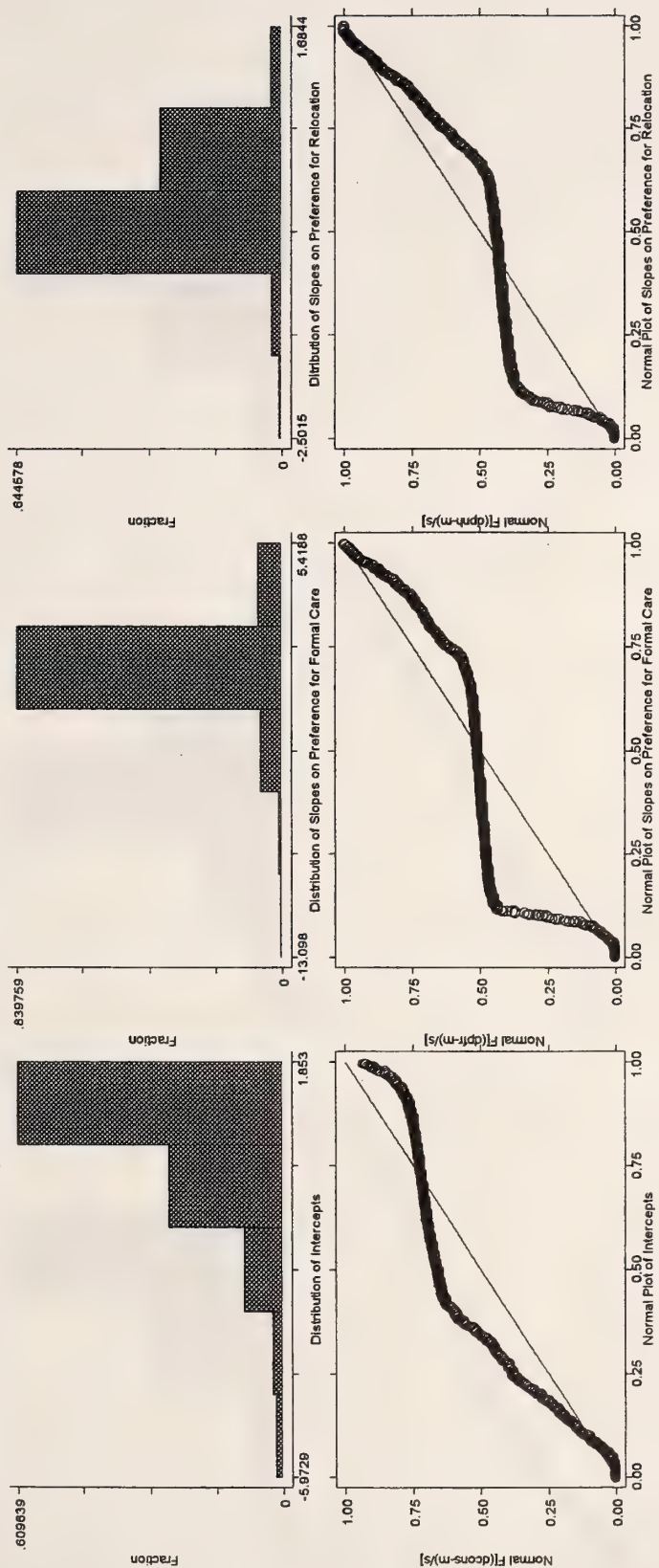


Figure 3 Decision to Intervene (Restricted Sample): Individual CM Intercepts and Slopes

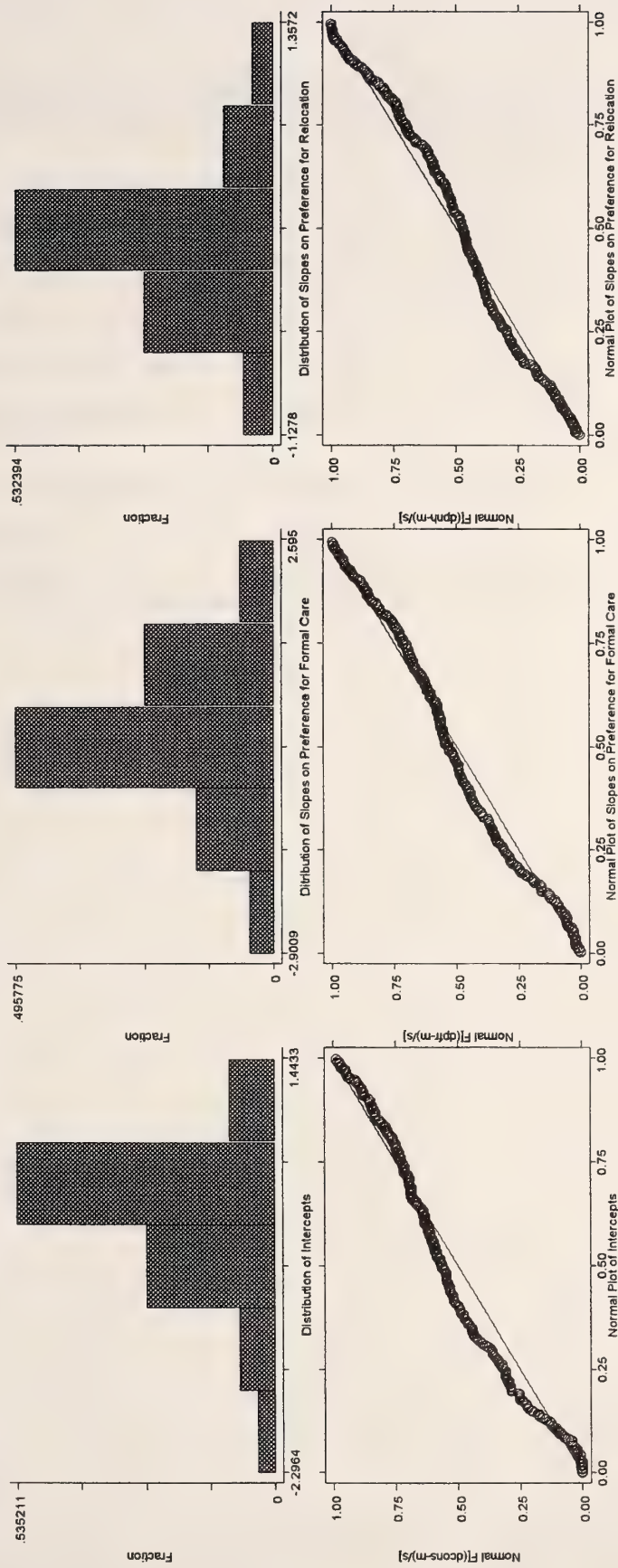


Table E.1 Bivariate Contrasts for Variables Associated With No Variation in Decision to Intervene Within Case Managers and Across Vignettes

	Variation	No Variation	Sig
Social Work	86 (37%)	146 (63%)	.039
Neither Nurse or SW	269 (45%)	329 (55%)	
Licensed SW	111 (45%)	136 (55%)	.411
Not Licensed SW	244 (42%)	339 (58%)	
Supervisors Approve Assessments	148 (47%)	164 (53%)	.035
Approval Not required	207 (40%)	311 (60%)	
Wisconsin	30 (32%)	63 (68%)	.030
Other States	325 (44%)	412 (56%)	

APPENDIX F: SUPPLEMENTARY TABLES

Table F.1. Medians of Case Managers' Slopes for Percentiles of Intercept in Out-of-Home Model

Percentile	95% Confidence Interval			Median of Slopes		
	Intercept	Lower	Upper	Paid home care	Family Care	Relocation
10	-1.94683	-2.042915	-1.81784	-.168085	.24962	.0631865
25	-1.0278	-1.185847	-.894084	-.10584	.020912	.35632
50	.14092	.0095712	.2570804	-.03545	-.223175	.17751
75	1.156475	1.001661	1.254083	.095191	-.17034	-.24949
90	1.84589	1.764766	1.975837	.291325	-.0287675	-.6458

Table F.2. Institutional and Residential Capacity in Selected States

State	Board & Care Beds ^a (1991)	Residential Care Beds ^b / 1000 65+ (1994)	Nursing Home Beds (1995)	Nursing Home Beds/ 1000 65+ (1994)	Ratio of Nursing Home to Foster Home
California	70059	44.3	140203	41	0.9
Colorado	4183	19.6	19912	55	2.8
Connecticut	2543	6.6	32827	70	10.6
Florida	34674	24.2	72656	30	1.2
Georgia	5528	19.6	38097	55	2.8
Indiana	1707	13.1	59538	81	6.2
Massachusetts	6321	6.6	54532	65	9.8
Minnesota	5826	21.9	43865	78	3.6
Ohio	5197	11.7	106884	61	5.2
Washington	9303	31.3	28464	46	1.5
Wisconsin	7443	25.6	48754	70	2.7

^a Non-mentally retarded.

^b Includes licensed residential care facility and board and care only.

Source: AoA, 1994; AARP, 1996.



8 47821000 5708 3

Appendix E

Table E.1. Institutional and Residential Capacity in Selected States

State	Board & Care Beds* (1992)	Residential Care Beds* (1992)	Home Beds (1992)	Home Beds (1994)	Hours of Nursing Home Care (1994)
California	70658	44.3	14002	47	0.2
Colorado	4183	19.6	19912	66	3.2
Connecticut	2543	8.8	20827	70	10.8
Florida	24074	24.2	72208	30	1.2
Georgia	3838	16.6	26007	28	2.6
Illinois	1707	13.1	20336	81	0.2
Massachusetts	8321	8.8	24022	86	0.8
Minnesota	8826	21.9	43898	28	0.8
Ohio	6187	11.7	108884	81	2.2
Washington	8902	21.9	20464	46	1.6
Wisconsin	7443	22.8	48784	70	2.7

* Non-internally retained.
 * Includes licensed residential care facility and board and care only.
 Source: AHA, 1994; AARP, 1992.

